

596-0066

PP-AAK-260

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AGENCY FOR INTERNATIONAL DEVELOPMENT PROJECT PAPER FACESHEET		1. TRANSACTION CODE <div style="border: 1px solid black; padding: 2px; display: inline-block; margin-right: 10px;">A</div> A ADD C CHANGE D DELETE	PP 2 DOCUMENT CODE 3
3. COUNTRY ENTITY ROCAP		4. DOCUMENT REVISION NUMBER <div style="border: 1px solid black; padding: 2px; display: inline-block; margin-left: 100px;">2</div>	
5. PROJECT NUMBER (7 digits) <div style="border: 1px solid black; padding: 2px; display: inline-block; margin-left: 20px;">596-0066</div>	6. BUREAU OFFICE A SYMBOL B CODE <div style="border: 1px solid black; padding: 2px; display: inline-block; margin-left: 20px;">LAC</div> <div style="border: 1px solid black; padding: 2px; display: inline-block; margin-left: 20px;">5</div>	7. PROJECT TITLE (Maximum 40 characters) <div style="border: 1px solid black; padding: 2px; display: inline-block; margin-left: 20px;">TRANSFER OF TECHNOLOGY</div>	
8. ESTIMATED FY OF PROJECT COMPLETION FY <div style="border: 1px solid black; padding: 2px; display: inline-block; margin-left: 20px;">81</div>		9. ESTIMATED DATE OF OBLIGATION A INITIAL FY <div style="border: 1px solid black; padding: 2px; display: inline-block; margin-left: 20px;">76</div> B. QUARTER <div style="border: 1px solid black; padding: 2px; display: inline-block; margin-left: 20px;">-</div> C. FINAL FY <div style="border: 1px solid black; padding: 2px; display: inline-block; margin-left: 20px;">80</div> (Enter 1, 2, 3, or 4)	

10. ESTIMATED COSTS (\$000 OR EQUIVALENT \$) -						
A. FUNDING SOURCE	FIRST FY <u>76</u>			LIFE OF PROJECT		
	B. FX	C. L C	D. TOTAL	E. FX	F. L C	G. TOTAL
AID APPROPRIATED TOTAL	100		100	399	854	1253
(IGRANT)	100		100	399	854	1253
(LOAN)						
OTHER U.S. 1.						
2.						
HOST COUNTRY		22	22		650	650
OTHER DONOR S:						
TOTALS	100	22	22	399	1504	1903

11. PROPOSED BUDGET APPROPRIATED FUNDS (\$000)									
A. APPROPRIATION	B. PRIMARY PURPOSE CODE	PRIMARY TECH. CODE		E. 1ST FY <u>76</u>		H. 2ND FY <u>TQ</u>		K. 3RD FY <u>77</u>	
		C. GRANT	D. LOAN	F. GRANT	G. LOAN	I. GRANT	J. LOAN	L. GRANT	M. LOAN
(1) EH	750B	977		100		120		90	
(2)									
(3)									
(4)									
TOTALS									

A. APPROPRIATION	N. 4TH FY <u>78</u>		O. 5TH FY <u>79</u>		LIFE OF PROJECT		12. IN-DEPTH EVALUATION SCHEDULED
	P. GRANT	Q. LOAN	R. GRANT	S. LOAN	T. GRANT	U. LOAN	
(1) EH	183		250		1253		<div style="border: 1px solid black; padding: 5px; display: inline-block;"> MM YY 16 79 </div>
(2)							
(3) FY 80			510				
(4)							
TOTALS							

13. DATA CHANGE INDICATOR. WERE CHANGES MADE IN THE PID FACESHEET DATA, BLOCKS 12, 13, 14, OR 15 OR IN PRP FACESHEET DATA, BLOCK 12? IF YES, ATTACH CHANGED PID FACESHEET.

1

 1 - NO
 2 - YES

14. ORIGINATING OFFICE CLEARANCE		15. DATE DOCUMENT RECEIVED IN AID W. OR FOR AID W. DOCUMENTS, DATE OF DISTRIBUTION	
SIGNATURE	<div style="border: 1px solid black; padding: 5px; display: inline-block;"> MM DD YY 10 12 78 </div>		
TITLE			
Harry Ackerman Director, ROCAP		DATE SIGNED	<div style="border: 1px solid black; padding: 2px; display: inline-block;"> MM DD YY 10 16 78 </div>

NOV 24 1978

ACTION MEMORANDUM FOR THE ASSISTANT ADMINISTRATOR (LAC)

FROM: LAC/DR, Marshall D. Brown

Problem: To authorize \$250,000 for Phase II of the ROCAP Transfer of Technology Grant Project, No. 596-0066.

Discussion: The purpose of the project is to establish a mechanism (Program of Technology Transfer - PTT) which can initiate and sustain the transfer of technological information from regional and extra-regional sources to small and medium-scale enterprises in Central America. The revised Project Paper covers a Phase II extension until March 31, 1981 of the original PTT Project approved in 1976. During Phase I, a PTT unit was established within the Central American Research Institute for Industry (ICAITI); a management reporting system was developed; and information contacts with U.S. and Central American institutions were established. Phase II will expand and strengthen the PTT network by placing field representatives in each country, increasing client contacts, and improving staff effectiveness. It will also demonstrate the importance of an outreach mechanism and fully integrate the PTT into ICAITI's overall operations.

The total cost of Phase II will be \$1,460,000, of which AID's contribution will be \$909,000 and ICAITI's \$551,000. The AID grant will finance U.S. and local technical assistance (\$248,000), contract services (\$141,000), training (\$23,000), and some operating costs of the PTT (\$348,000). Counterpart funds will finance local technical assistance (\$148,000), contract services (\$89,000), training (\$22,000), and operating costs of the PTT (\$292,000).

The Mission submitted the original PP for Phase II in July 1978. Interim FY 78 funding of \$183,000 was authorized at that time, but approval for full funding of Phase II was deferred until the Mission could submit a revised PP resolving three outstanding issues: project strategy and the role of ICAITI field agents, likely impact of the PTT, and the extent to which ICAITI could recover full costs from users.

An Issues Meeting was held on October 25, 1978 to discuss whether the Revised Project Paper adequately addressed these issues. The DAEC determined that the issues had been resolved, and approved the Project Paper subject to the following minor modifications:

1. Sections of the Project Paper describing the role of the field agents, and their relationship to local institutions in the various Central American countries, were expanded.

2. Language was added describing how the planned evaluations will be used to make necessary mid-course corrections in the project design. The date of the first Phase II evaluation was also moved forward to June 1979.

3. A section on waivers was added to justify use of AID grant funds for local cost financing, particularly local technical assistance. Language was also added to clarify that ICAITI will increasingly assume these costs, and will be able to finance 100% of the local costs by the end of Phase II.

The project proposes to institutionalize the PTT within ICAITI. This requires the recruitment, hiring, and training of qualified Central Americans for the field agent positions. ICAITI has been unable to assume the start-up costs of establishing this field network; therefore AID local cost financing is required on a temporary basis. The authorization provides for procurement of goods and services, except ocean shipping, which have their source and origin in the Central American Common Market and the United States.

On September 11, 1978, the AA/LAC determined that the project would not have a significant effect on the human environment and would not require an Impact Statement or Environmental Assessment. The project is included in the FY 79 Congressional Presentation for \$210,000. Since both the proposed FY 79 obligation and life-of-project funding have increased, a Congressional Notification is required. An Advice of Program Change was forwarded on November 8, 1978, and the project can be authorized on November 22, 1978.

Recommendation: That you sign the attached Project Authorization and Request for Allotment of Funds (PAF) for the ROCAP Transfer of Technology Project.

DEPARTMENT OF STATE
AGENCY FOR INTERNATIONAL DEVELOPMENT
WASHINGTON, D. C. 20523

**ASSISTANT
ADMINISTRATOR**

PROJECT AUTHORIZATION AND REQUEST FOR ALLOTMENT OF FUNDS

Name of Entity : Central American Research
Institute for Industry

Name of Project: Transfer of Technology
Project Number : 596-0066

Pursuant to Part I, Chapter 1, Section 103 of the Foreign Assistance Act of 1961, as amended, I hereby authorize an additional Grant to the Central American Research Institute for Industry ("ICAITI") of not to exceed Two Hundred Fifty Thousand United States Dollars (\$250,000) to help in financing certain foreign exchange and local currency costs of goods and services required for the project hereinafter described. The project consists of the establishment of a technology transfer mechanism with the capacity to initiate and sustain the transfer of technical information and applied technologies from regional and extra-regional sources to end user firms in Central America (the "Project"). Grant funding in the amount of Four Hundred Ninety-three Thousand United States Dollars (\$493,000) has already been provided to this Project.

I approve the total level of additional A.I.D. appropriated funding planned for this Project of not to exceed Seven Hundred Sixty Thousand United States Dollars (\$760,000), including the funding authorized above, during the period FY 1979 through FY 1980. I approve further increments during that period of Grant funding up to \$510,000, subject to the availability of funds in accordance with A.I.D. allotment procedures.

I hereby authorize the initiation of negotiation and execution of the Project Agreement by the officer to whom such authority has been delegated in accordance with A.I.D. regulations and Delegations of Authority, subject to the following essential terms and covenants and major conditions, together with such other terms and conditions as A.I.D. may deem appropriate:

I. Source and Origin of Goods and Services

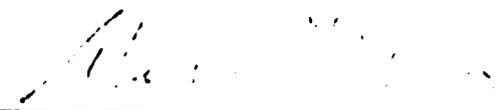
Goods and services, except for ocean shipping, financed by A.I.D. under the Project shall have their source and

origin in the Central American Common Market or in the United States, except as A.I.D. may otherwise agree in writing. Ocean shipping financed under the Grant shall be procured in the United States.

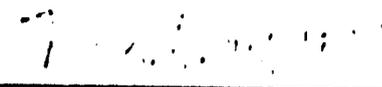
II. Covenants

Except as A.I.D. shall otherwise agree in writing, ICAITI shall covenant and agree to:

- (a) provide such goods and services as may be agreed upon between A.I.D. and ICAITI for a total value of not less than the equivalent of five hundred fifty-one thousand United States Dollars (\$551,000), including the services of a Project director, during the period commencing October 1, 1978, through December 31, 1981; and
- (b) develop annual work plans, satisfactory in form and substance to A.I.D., for the field agents which shall address, inter alia, the special activities to be directed at small industries during each year. This will include the establishment of targets and quotas for small industry participation in services provided by ICAITI under this Project.

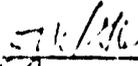


Assistant Administrator
Bureau for Latin America and the
Caribbean



Date

Clearance:

GC/LAC, JKessler  Date 11/6
LAC/DR, CPeasley  Date 11/11/78

LAC/DR, MBrown  Date 11/29 1978
LAC/CEN, PParley _____ Date _____

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ANNEXES

I. PROJECT SUMMARY AND RECOMMENDATIONS

A. Recommendations

1. Approval of Phase II of the project as described herein for an additional cost to A.I.D. of \$760,000 (to be added to the \$493,000 previously approved for the operational feasibility study), for a total cost to A.I.D. of \$1,253,000.

2. Approval of extension of the project activity completion date by 12 months to March 31, 1981 (increasing Phase II from the initially projected 18 months to the recommended 30 months).

3. Notification to Congress of the above actions.

4. Authorization of procurement from the Central American Common Market.

5. Authorization of FY 1979 funding in the amount of \$250,000 to fund Phase II through October 31, 1979.

B. Description of the Project

1. Grantee. The Grantee will be the Central American Research Institute for Industry (ICAITI) which will be responsible for continuing and expanding the project in coordination with the five Central American countries and other donors.

2. Project Summary. This project extension supports the establishment of a self-sustaining technology transfer system with the capacity to initiate and sustain the transfer of technical information and applied technologies from regional and extra-regional sources to end users in small and medium firms in Central America.

As conceived in the original project paper, "Provided that Phase I is successful, it is envisioned that during Phase II the PTT would be expanded to full scale status. The number of field agents would be increased so that each Central American country would have at least one field representative; the back-up support at ICAITI would be strengthened and institutionalized as would be the back-up support from the U.S. consulting firms." The three evaluations of Phase I, in addition to making their own contributions to project progress through numerous helpful recommendations which have led to useful adjustments, have found that the necessary base for expansion to full scale status as originally envisioned has been

laid. The most recent evaluation conducted by Checchi and Company in June, 1978, concluded that "ROCAP assistance to the PTT should continue through the proposed Phase II and possibly beyond."

ICAITI and ROCAP have agreed that a 30-month period for Phase II will allow sufficient time to expand the program to full scale status and to fully institutionalize it within ICAITI.

3. Summary Financial Plan. The costs of activities to be financed under Phase II total \$1,460,000 of which A.I.D. contribution will be \$909,000 and ICAITI's \$551,000 (including participating national agencies in-kind contributions in each of the countries). A.I.D. and ICAITI contributions are summarized below:

	A.I.D. ^{1/}		ICAITI	
	<u>FX</u>	<u>LC</u>	<u>LC</u>	<u>TOTAL</u>
Technical Assistance	\$118	\$192	\$148	\$ 458
Contract Services	90	55	89	234
Training & Workshops	11	14	22	47
Operating & Other Costs	--	346	242	588
Contingency & Inflation	<u>22</u>	<u>61</u>	<u>50</u>	<u>133</u>
Totals	<u>\$241</u>	<u>\$668</u>	<u>\$551</u>	<u>\$1,460</u>

4. Summary Findings. On the basis of the analyses in this paper, reflecting the findings of the several project evaluations, ROCAP concludes that the project should be expanded into Phase II, that such expansion is consonant with ROCAP strategy, that Phase II will permit sufficient time for the technology transfer mechanism created under the project to be institutionalized in ICAITI, and that the concept of Phase II is technically, administratively, and financially sound. ROCAP recommends that Phase II be approved as proposed (a draft Project Authorization and Request for allotment of Funds is prepared at Annex 3).

II. BACKGROUND

This document revises the Project Paper for this activity dated April 1976 and approved by the DAEC on April 29, 1976

^{1/} Includes 149,000 authorized in FY 78

(approval cable is exhibited at Annex 1). A subsequent revision was approved, in part, by the DAEC on August 7, 1978 and partial funding for the second phase was approved (see STATE 219446, Annex I). The first phase was to be an operational feasibility study to establish a regional mechanism in Central America to facilitate the identification, gathering, adaptation and distribution of needed technology, primarily to small and medium industries. The project is carried out by the Central American Research Institute for Industry (ICAITI), a Central American regional organization formally mandated to identify and evaluate suitable technology for Central America. The activity is partially financed through September 30, 1979, and \$493,000 has been obligated to date.

Phase I, as an "Operational Feasibility Study", was to be flexible in design because it was groundbreaking in nature (ROCAP was and is unaware of any other regional institution in the developing world attempting such an activity on a multinational basis). Therefore, the first task for the approved activity was the actual in-depth design of the system.

ICAITI was to hire field representatives, service contracts with U.S. suppliers, make its own technical personnel available, and otherwise support and develop a transfer system. The project was to respond to a variety of LDC demands in international fora for assistance in the development of their indigenous technical capacities, and to provide small and medium scale businesses with access to modern production techniques more readily available to their larger competitors.

Currently, the Program for Transfer of Technology (PTT) consists of a unit within ICAITI to process and respond to (from its own resources or drawing on established outside resources), technological assistance requests generated primarily by three trained PTT agents stationed in Chamber of Industries Offices in Costa Rica, El Salvador (having responsibility for Nicaragua) and Guatemala (having responsibility for Honduras), who:

- Contact and maintain liaison with small- and medium-scale businesses in their areas and with ICAITI headquarters in Guatemala where

- action is taken by either ICAITI technical personnel or

- other technology sources inside or outside the region. Services generally are provided on a fee basis, in accord with ICAITI's billing policy.

The summary findings of Phase I, based upon three evaluations and extensive discussions with ICAITI and other agencies' professional staffs, concluded that:

1) There continues to exist within Central America a demand for improved access to technological information and assistance.

2) The PTT, during the Operational Feasibility Study (Phase I), has demonstrated that it can help meet that demand in a cost-effective manner.

3) The PTT regional approach to technology acquisition is acceptable to Central American public and private institutions.

4) ICAITI is the appropriate locus within Central America for the PTT and has the necessary management capacity for, and interest in, furthering project objectives.

5) The activity merits continuance and expansion to Phase II as proposed herein.

6) The PTT has the potential to become self-sustaining at the end of Phase II.

III. PROJECT DESCRIPTION

A. Goal

The approved project goal is "to improve the technology transfer process to industries in Central America, emphasizing small and medium-scale enterprises".

B. Purpose

The approved project purpose is:

To establish a technology transfer mechanism (Program of Technology Transfer - PTT) that has the capacity to initiate and sustain idea, information and technology exchange between Central America and foreign "sources", and Central American "users" (firms).

C. Outputs

Outputs for Phase II are structured to subsume and expand the outputs originally structured for Phase I. These are discussed below.

1. Transfer Mechanism Established. This output subsumes the first output of Phase I, "The establishment of a technical and administrative structure to carry out technology transfer activities". In Phase II the mechanism will be expanded and fully integrated into ICAITI's regular organization as a permanent and, eventually, self-sufficient activity element.

2. Staff Effectiveness Improved. This output subsumes the third output of Phase I, "Adequately trained field representatives and support staff". In Phase II additional field representatives will receive basic training in the United States, and all project staff will undergo periodic on-the-job training to continually upgrade capacities for project performance. This output includes also the continued refinement of operating procedures to reduce the time needed for service deliveries and to improve the reporting base for better data upon which operational analyses may be based.

3. Transfer Activity Increased. This output subsumes the remaining outputs for Phase I (analysis of industrial sectors and client needs, design of interventions, operational analyses and service deliveries). The thrust of this output will be the expanded scope of activity permitted by the expanded project staff. Monthly contacts, which have been averaging some 40 per month, are projected to increase to 60 with half of those projected contacts entailing some kind of service. This quantitative measurement must be balanced against equally important qualitative measurements. Project observers have noted the possible diminishing returns of an overemphasis on simple quantitative measurements which downplay the importance of more technical and substantive services deliveries which take more time than simple services (simple information, for example) but which may well constitute a more significant project function. A proper balance between these countervailing considerations will be sought in Phase II. This output will rely also on the expansion of the number of extra-regional technology sources to which ICAITI may refer for specific technologies as needed.

4. Small Industry Activity Increased. This is a new output. At least ten seminars per year will be organized around identified small industry requirements. Approximately 200 small businessmen will be reached. Costs to participants will be minimal. ICAITI targets and quotas will be established in which contacts and diagnostics for small firms will comprise at least 50% of their activities. Annual work plans will be developed to implement this focus.

D. Inputs (Phase II)

AID will provide US technical assistance (37.5p/m), local hire technical services (156 p/m), contract services for technology search and adaptation, training, and other costs for a total of \$909,000. ICAITI will provide local technical assistance, training, support costs and indirect project-related technology adaptation costs for a total of \$551,000.

Goal, purpose, outputs and inputs are summarized in the Logical Framework at Annex 5.

E. Detailed Description

Phase II is designed to establish the PTT as an integral part of ICAITI operations in Central America. The proposed financing will expand the network to all five Central American countries by hiring and training two more field representatives (thus providing one resident in each participating country).

Building upon the experience of Phase I, Phase II will structure its services to increase the rate of contact with small and medium scale industrial clients and the delivery of technological information and application to them.

The PTT is fast becoming central to ICAITI operations. When PTT started, little was known of what kind of problems would be encountered. For example, experience to date shows that PTT, by its nature, involves many activities that do not produce revenues, such as promotional visits and simple transfers of information or identification of sources of information. In consequence PTT has not produced revenues sufficient to cover costs. Presently, PTT depends for its

existence on ICAITI's willingness and ability to use other ICAITI resources, and AID grant funds through ROCAP. As the number of field representatives increases from three to five ICAITI will show an even greater disparity between PTT costs and revenues at the outset. A priority goal then of Phase II is to make PTT as financially self sufficient as possible. To attain this objective, ICAITI must ensure that the scale of PTT operations is not uneconomic.

To accomplish this goal, the PTT (and, by extension, ICAITI itself) will serve as a conduit for technology transfer for the entire range of technology needs of the industrial sector in Central America. As an integral part of ICAITI, the PTT may not exclude any potential user; however, as a practical matter, ICAITI activities are almost exclusively centered in the medium and small industrial sector. ICAITI defines the industrial sector in three categories:

- Large Industries: 100 or more employees and/or capital assets above \$1,000,000.
- Medium Industries: 30 to 99 employees and/or capital assets between \$200,000 and \$999,999.
- Small Industries: Less than 30 employees and capital assets less than \$200,000.

While being responsive to all inquiries, the PTT's marketing strategy is designed:

- (a) to train its field agents to detect, analyze, and service the specialized technology needs of smaller industries in Central America.
- (b) to establish field agent targets and quotas on smaller industry contacts and contracts;
- (c) to establish working relationships with institutions that, by their nature and focus, are small industry oriented (e.g. cooperatives, associations, etc.)
- (d) to provide specialized small industry technical assistance. In many cases, this may be done through in-country and low to no-cost seminars and conferences designed to attack identified small industry problems.

- (e) to promote small industry participation in the other relevant activities of ICAITI funded from other donor and local resources. (e.g. appropriate technology, non-conventional energy, rural industrial R&D, etc.).

In each Central American country, ICAITI field representatives will be located within the Chambers of Industry; however, their activities will include close relationships with other technology transfer activities. It is important to recognize that the PTT is only one small, but important, part of the technical information/problem solving apparatus that services Central American manufacturing concerns. Other parts include local productivity centers, the Central American network of national information centers, industry groups, salesmen, consultants, etc.

Phase II will continue to assist ICAITI in completing the setting in place of a technology transfer system that complements and interconnects these elements. The funding requested will complete the necessary "start-up" costs involved in creating such a system. This includes recruitment and selection of additional personnel, training them in specialized procedures and operations, identifying, selecting, and establishing working relations with the wide range of Central American organizations, firms, and individuals that comprise a working network. Included in this effort is the conduct of selected projects and tasks to highlight specialized small industry concerns. Seminars, conferences, and round table discussions will be carried out.

For the first time, ICAITI will prepare annual work plans for the PTT field agents which will include, inter alia, small industry targets and quotas for contacts, diagnostics, and contracts. In addition, specialized small industry seminars and conferences will be scheduled (largely in cooperation with national institutions, cooperatives, associations, etc.) and specialized training and technical assistance in small industry technology requirements will be given to the field agents.

During the extension, ICAITI will begin to share the "maintenance" costs of the PTT with other Central American participating institutions, most importantly the Chambers of Industry which will provide partial salary support, office space, secretarial support, local logistics, etc. to the field agents.

In addition, the costs paid by ICAITI for the maintenance of the PTT will be charged to the users of ICAITI's services.

ROCAP financing will terminate on March 31, 1981 and the PTT will be self-sustaining and dependent upon Central American resources for its continued operation.

ROCAP funding will decrease in the second year of the extension to 75% of direct PTT costs, and then 25% in the remaining period, with ICAITI assuming full costs thereafter.

IV. PROJECT ANALYSIS

The following sections provide an analysis of the constraints to technology transfer in Central America, experiences to date, and the economic and financial viability of the PTT. The analysis is geared, in large degree, to the issues raised in STATE 219446 (Annex 1).^{1/}

A. Experience to Date and Constraints

1. Constraint Analysis

Any discussion of impediments to the flow of technological information in the region must involve itself with a variety of views; i.e. national, institutional, and user interests and constraints in promoting technology transfer and use must be satisfied in order to have a program which has potential for success. Ultimate success, however, depends on the capability and interests of the actors involved in the technology acquisition - adaptation - transfer - use process and how closely their interests match those of their nation's policy makers.

(a) National Views

We need not belabor the views of the developing world regarding the importance they place upon improving their access to modern technology and their institutional capacities to acquire and adapt or develop technologies relevant to national conditions. The Findings and Recommendations section of Science and Technology for Development, Proposals for the Second United Nations Development Decade (United Nations 1970) states, inter alia, that "The well-known gap

^{1/} Reference cable included a recommendation to include in this extension request a study of light capital technology activities in Central America. Subsequently, it was decided that such a study should be carried out independently of this activity. ICAITI is also, under IDB and UNDP funding, proceeding in the areas of light capital technology, non-conventional energy, and rural industries. ROCAP's future involvement with ICAITI in these areas will be subject to the results of a strategy to be developed by ROCAP, C.A./USAIDS and AID/W.

between the living standards of the less developed countries and those of the highly developed countries has its parallel also in science and technology; indeed the growing gap between the amount of research and application in developed and developing countries, and between their levels of technology is one of the major factors in the growing gap in living standards. Whether one considers the number and equipment of research institutions or the number of scientific and technical personnel, or the technology of production, there is a striking contrast between the industrialized, wealthy countries and the developing countries. One consequence of this is that only a very small fraction of the world's scientific and technical resources is devoted to the problems of the developing countries; the overwhelming proportion of the world's intellectual capital, as well as its physical capital, is applied towards meeting the needs of the highly developed countries."

Not only was a gap said to exist between the degree of research and application in developed and developing countries, but the same report noted a "lack of an adequate international system for the selection and flow of scientific and technical information to developing countries..." AID's own 1978 analysis^{1/} indicates these problems "are no less serious today than in 1970" and may be worse.

The PTT does not have pretensions of completely satisfying these needs - it does, however, offer a means to institutionalize a permanent process whereby existing scarce manpower and institutional resources in Central America can effectively support a technology acquisition adaptation-transfer system, with particular emphasis on medium and smaller scale users. This system has been thrice evaluated since inception and "definitely recommended (for) continued support.... through the proposed Phase II."^{2/}

^{1/} "Technology Exchange and Cooperation, A program Proposal", Jim Roush, AID, February 7, 1978.

^{2/} Project Evaluation Report 78-7: 596 0066 Transfer of Technology, CAPTO A-28 August 1, 1978.

(b) Institutional Views

From ICAITI's viewpoint as a technology institution involved in the technology transfer process, a number of important constraints must be overcome before commitment to an ongoing program which would seek out clients ("users") is made. These include:

- Demand: Whether, notwithstanding the entreaties of the Central American countries, sufficient demand exists within these nations to justify the institutional commitment of men and money to support a transfer network.
- Sources: Whether, given an interest in users, suppliers of information can be located willing to act as searchers for information.
- Manpower: Whether ICAITI (and by extension, other CA technology sources) can locate sufficient skilled personnel capable of undertaking such technology modification as may be necessary to "customize" a new process to individual user requirements.
- Financing: Whether resources can be found to support the creation of a technology acquisition - adaptation - transfer system sufficient to allow time for the program to prove its utility.
- Coordination: Whether national, regional, and international public and private institutions can either formally agree, or reach de facto agreement, regarding what roles they would play in a technology transfer system, in order to avoid unnecessary and costly duplication of effort. A student of the subject^{3/} calls

^{3/} "Intermediate Technology: An Informal Survey", Peter W. Askin, Senior Seminar in Foreign Policy, 18th Session (undated).

coordination "the first order of business" in helping focus the appropriate technology movement. Although his discussion focuses on appropriate technology and calls for "an international appropriate technology center or network" beyond the scope of the PTT, avoidance of duplication and reinvention of the wheel is fundamental to the PTT.

Timeliness of the process: Whether the information chain is too long and time consuming, i.e. whether the system, upon being asked, can devise a solution with sufficient rapidity to increase the system's reputation and future use.

Sophistication: Whether accessible information exists to meet the varying demands of relatively less sophisticated technology users - the PTT target - sufficient to minimize requirements for on-site solution development.

At project onset, ROCAP's original Project Paper analysis stated that "the current flow of know-how to Central America is fragmented, disorganized and not always effective", i.e. the foregoing constraints were not being satisfied. Experience since PTT inception, however, has been encouraging for the following reasons:

Demand: the PTT has helped articulate an effective technology demand within Central America, especially in the countries of residence for the three PTT field agents. Annex II provides a list of technologies developed and/or transferred by ICAITI during the last three years. The list does not include hundreds of simple and complicated information requests. No systemized record was kept of these requests. Table 1 Summary Data of PTT Services: September 77 to August 78 shows that of the 269 contacts made, 41 percent were directed at small and another 41 percent to medium concerns. Chambers of Industry have provided - and during this extension - will increase support for the program and have publicized the program through their national directories.

Sources and Manpower: the latest ICAITI evaluation noted that "never before in the... history of ICAITI has it been called upon to

exert more effort to guide, match, pace and interlock its activities internally among its own divisions and externally with regional and extraregional organizations working in... technology transfer." A review of Table I shows that most PTT services were provided either by ICAITI itself (47 percent) or by the PTT engineer national representatives (31 percent), and that of total services provided during the period, 55 percent provided information, principally from ICAITI's Documentation and Information Division, which with OAS support is the focal point and guiding unit for the Central American network of national information centers (SIATE). ICAITI manpower, the table reveals, have provided laboratory services and direct technical assistance in 66 percent of the cases generated under the activity, a good indication of ICAITI's ability to draw on its own stable of skilled manpower.

- Financing: This constraint is dealt with at length elsewhere in this document. Suffice here to note that under Phase I AID supported development and initial operation of the PTT; that in the second phase its services will be expanded to all of Central America, be better targetted on seeking smaller enterprise participation, and become absorbed as part of ICAITI's regular operations, with costs at the end of Phase II totally coming from ICAITI's operations budget, the Chambers of Industry and users.
- Coordination: This activity depends on coordination - it is an institution-building project, but it does not add substantial new facilities to the region. What it does provide is a conduit for transfer of technical information and assistance from sources within and without Central America - public, private, national and international - to businesses within the region. While the field agents and ICAITI take a leadership role in coordinating - or matching - requests with sources, to date evidence demonstrates increasing requests of cooperating national technology institutions for closer cooperation to use the

TABLE I
SUMMARY DATA OF PTT SERVICE

September 1977

TOTAL CENTRAL AMERICA

SIZE OF INDUSTRY	TYPE OF SERVICE				ACTION TAKEN				TYPE OF INDUSTRY							
	RAW MAT.	PROCESS	EQUIPMENT	OTHER	REP.	LOCAL	ICAITI	OTHER	1	2	3	4	5	6	7	
Information																
Total	149	35	52	29	33	52	38	47	9	45	15	18	14	22	1	32
Small	59	15	23	12	9	29	14	16	-	30	7	6	6	6	1	4
Medium	62	11	22	12	17	24	14	20	4	12	5	8	7	13	-	13
Large	28	9	7	5	7	3	9	11	5	3	3	4	1	3	-	15
Technical Assistance																
Total	60	-	59	1	-	16	2	41	1	20	4	7	7	13	9	3
Small	30	-	29	1	-	12	-	18	-	5	2	3	2	9	9	-
Medium	24	-	24	-	-	4	2	17	1	12	2	4	3	4	-	2
Large	6	-	6	-	-	-	3	6	-	3	-	-	2	-	-	1
Service																
Total	60	-	59	-	1	13	7	39	1	21	10	5	5	10	-	11
Small	21	-	20	-	1	4	2	15	-	10	3	-	3	3	-	2
Medium	25	-	25	-	-	6	4	15	-	8	5	4	1	6	-	3
Large	14	-	14	-	-	3	1	9	1	3	2	1	1	1	-	6
Size																
Totals																
Total	269	35	170	30	34	83	48	127	11	84	29	30	26	45	10	45
Small	110	15	72	13	10	43	18	49	-	44	12	9	11	18	10	6
Medium	111	11	71	12	17	34	20	52	5	31	12	16	11	23	-	18
Large	48	9	27	5	7	6	10	26	6	9	5	5	4	4	-	21

Industrial Key

- | | |
|-------------|-------------------|
| 1. Food | 5. Metal mechanic |
| 2. Chemical | 6. Construction |
| 3. Textile | 7. Others |
| 4. Paper | |

PTT to satisfy their own technology needs.

Timeliness of the Process: that experience to date shows the PTT has relied principally on ICAITI and other Central American resources for need of technologic information also is cause to expect rapid responses. Indeed, if information were available from other sources more quickly and at equivalent cost as the PTT, use of the system would not be growing and neither ICAITI nor ROCAP would be interested in continuing the activity. The record for use of the U.S. information networks has been less encouraging; trial requests required 115 and 58 days before Georgia Institute of Technology and Denver Research Institute responded. These operational problems have been discussed at high levels with representatives of the two institutions as well as with CODOT, which never responded to the trial. Better performance has been achieved subsequently, however.

Sophistication: ICAITI has observed that "most information has been developed for highly qualified technicians...difficult to be understood by the (layman) potential users in Central America. Most of the technical literature is written in a form unintelligible to the non-technologist." The PTT not only acts as an information conduit but also must interpret, help adapt or adopt new or revised processes to regional user requirements - a skill held by the field agents and other project supporting staff which is key to any successful technology transfer.

(c) User Views

Transfer of Technology, as with any other change, requires a source, an item being exchanged, and a

4/ "Constraints Within the Transfer of Technology Process"
E. Hill, ICAITI (undated).

recipient who is in need of the item. A brief review of what constraints the potential PTT user may face reveals the following:

- Sources are not well defined. Whereas larger enterprises either maintain their own or have linkages to other technology laboratories and libraries, smaller scale enterprises tend not to have them. National and regional facilities, which have services which could be useful frequently lack sufficient outreach capabilities or trained manpower to service more than certain kinds of industries, e.g. artesanía, wood-working, etc.
- Availability/sophistication of information (the item of exchange) as well as ease of access to it can make technology transfer an easy or discouraging process. If the PTT client is satisfied, he is likely to use the service again and encourage others to do so by word of mouth. If the information supplied is too sophisticated or otherwise found to be unsuitable to the recipient and the information source has no "customizing" agent, the transfer process is thwarted, and its reputation impaired.
- Recipient attitudes towards change, the "show me" attitude, requires skilled, convincing transfer agents who can give reasonable assurance that new information, if applied, has high probability of success and reasonably low risk, and that the acquisition process will be affordable.

The PTT, of course, recognizes and operates within these constraints. Field agents major task is establishing contacts with individual users or user associations. Seminars have been used as an efficient means of imparting information to potential user groups, and, as targeting concentrates on smaller-scale enterprises the agents will resort to seminars and other groups - rather than single users - to increase outreach. Another mode, already occurring, has the PTT cooperating and providing services to national information transfer agencies to support particular problems they may encounter - indeed, close cooperation and support with national programs significantly broadens the impact of PTT services.

(d) Role of the Field Agent

The PTT field agents and the Senior Sales Engineer are at the heart of the PTT (Annex 9 provides a view of the steps necessary to implement a transfer activity and the field agents necessary actions.) They are the only ICAITI personnel who devote all their time to the project. The field agents are the only permanent ICAITI representatives stationed away from Guatemala headquarters. They are responsible for:

- publicity: at inception, the field agents had to explain to private and public sector representatives and agencies what the PTT was designed to do, how it would function and at what cost.
- coordination: the PTT is not designed to replace other existing national or international technical assistance services. ICAITI, has played a role in establishing or assisting some of these institutes, has working relationships with all of them, is coordinating an integrated network of technical information centers in Central America, and, as a regional institution responsible to Ministers of each Central American Republic, is sensitive to national institutional interests. The field representatives have consequently been careful to establish cooperative relations with national centers of expertise which has resulted in an interchange of information requests between the PTT field agents, ICAITI and national centers. Such an arrangement was envisioned during project design - especially since a major expansion of ICAITI's technical capacity is not an objective of the activity.
- outreach: while prior to advent of the PTT ICAITI did receive requests from outside Guatemala, the field agents have major responsibilities in "bringing" ICAITI to users outside of Guatemala, and for seeking target group clients for the PTT.

identify technological needs: the field agents are responsible for the initial formal articulation of technologic requirements of potential PTT users. Subsequently they:

- a. organize and/or conduct seminars, workshops, conferences, industrial diagnosis;
- b. contact technology providers or see that ICAITI or national institutions do, on behalf of clients; and
- c. participate in negotiations between technology providers and seekers regarding type and cost of services to be provided.

Beyond the identification of technology needs, the field agents help to assess the most appropriate response to a particular technology problem. For simple information requests, the agents may either use local information sources or the NTIS repository in ICAITI through the SIATE network in Central America. In this case, they may also provide some relevant technical advice on how best to apply the information if it is within their technical expertise (or alternatively, they will direct the information seeker to a local source of advice). In some cases, the agents may be able to provide direct technical assistance, especially as the agents become more deeply involved in the problems of small and medium industry through the increasing performance of diagnostic services. As problems beyond the agents' expertise emerge, however, we expect that they will expand their present practice of calling upon local sources and, of course, ICAITI services. As noted elsewhere, the agents will be required to perform increased promotional and selling services, thus perhaps limiting their direct technical assistance roles. To the extent that this is the case, they will necessarily link their services to other sources of advice, be it national, regional, or extraregional.

The demand for technical assistance is expected to increase substantially (see footnote 1, page 20) as the system expands to full coverage in all five countries. It is unrealistic to expect that the field agents will be able to increase their direct technical assistance activities proportionately. They will, however, ensure that the increased demand for technological information that our experience indicates will occur is met and that the information provided is adequate, appropriate, timely, and utilizable. In this regard, the expanded use of such outreach activities as seminars, workshops, training, and on-site technical and engineering services will be emphasized.

(c) Alternative Designs

Alternatives to the PTT as herein proposed were considered prior to submission of the original project paper. These included:

- the financing of a specified number of sophisticated technology transfers including negotiation for and possible partial financing for proprietary technologies by ICAITI, and

- a system whereby ICAITI would support and exclusively operate through selected national technical assistance agencies. Institution building for the national project components would be included. Priorities would be set by the national institutions.

Both were rejected for a variety of reasons including the limited impact of direct transfer of a few items, the difficulty involved in coordinating and targeting a regional activity without having operational control of the outreach agents, the uncertain commitment and skills available in the nations to perform technology outreach and diagnosis, the desire to have close operating relationships to the private sector through Chambers of Industry, and, foremost, ICAITI's mandate and experience in the field. As correctly observed in the original project evaluation^{1/}, "the PTT does not represent a radically new activity for ICAITI. ICAITI has considered technology transfer within its charter and has denoted it as a principal organizational activity for some time. The unique element of PTT is the extended outreach capacity provided by the field representatives. PTT also extends, and targets, ICAITI's reach toward outside agencies which can provide needed technological information and assistance. And PTT provides a sharper marketing and management focus on technology transfer within ICAITI. Thus the project can add substantially to ICAITI's capacities."

^{1/} CAPTO A-36, July 1977

Additionally, the PTT now provides the opportunity not only to target outside agencies but also to target increasing attention and services on small business requirements, as is discussed elsewhere in this paper.

(f) PTT Experience^{1/}

Table I shows the results of an analysis of field representative activities between September 1977 and August 1978 showing not only the type of industry recipient but the type of service provided, by whom provided and the size of the recipient. This data show, with regard to size of PTT users, that greatest project efforts already have been given to aiding small and medium scale industry (41 percent each), leaving only 18 percent of the activity for large industrial concerns. With achievement of the reasonable targets discussed elsewhere in this paper, there will be a continued shift of emphasis to small firms.

1. With regard to the kinds of service provided the analysis shows information to be the most popular (55 percent of all services rendered), with services usually provided by either ICAITI itself or the field agents, and technical assistance sharing the remaining 45 percent.

This ranking is to be expected:

- information has been used as the introductory activity that demonstrates to the potential clients the usefulness of PTT services; as industrial diagnoses begin to be conducted for small scale PTT users, the supply and interpretation of relevant technical information will have a proportionally even more important role.

^{1/} During the trimester June through August of this year the PTT continued increasing its pace of activities. New contacts during the three-month period totaled 110 (compared with 159 for the previous nine months) of which 92 were almost equally divided between small (48) and medium concerns (44).

- the cost of providing information services is relatively low and no change is made for it; again making it more accessible for small-scale users;
- many potential clients want to see something in writing from a reliable source before they make a decision, i.e., PTT advice and assistance always is more readily accepted if supported by printed information.

PTT "services," as discussed above, consist of laboratory analyses particularly in the areas of quality control and process evaluations. Food producers, processors and manufacturers have been the greatest users of these services which ICAITI can furnish using its own facilities and manpower at relatively low cost. Although "Technical Assistance" shares with services, project demand, we expect technical assistance to be the least used kind of service the PTT will be called on to provide in the future because it requires the greatest investment of time, money and effort by consultant and recipient in preparation of the request and in its utilization. It requires personal attention of a technician at the premises of the industrialist; and consequently, is also the most expensive of the three categories of PTT services. Hopefully, this element will increase.

2. With regard to the source of services provided, ICAITI (excluding the field agents) leads with 47 percent since its entire institutional facilities are available under the program. This is to be expected as the PTT is called upon to provide services requiring either a high degree of expertise or the special facilities which an institution like ICAITI maintains. The field agents provided 31 percent of PTT services and local sources 18 percent. Local sources are low but are participating more in delivering services -- especially as field agents increase their working relations with them. Further, direct referrals by PTT agents to local sources are sometimes not registered as PTT actions if, in the judgment of the field agent, his role was merely to set a client on the right track - important as that service may be. "Other" is the least used source and refers to cases where the contracted information networks of DRI, Georgia Tech. or CODOT have been used. PTT is structured to exhaust first local and regional capability prior to utilizing outside resources.

3. With regard to the type of industry serviced, and in accord with ICAITI's 1976 industrial sector priority review (see economic feasibility section), food industry leads

(31 percent). It also contains the largest number of small firms. ICAITI's strengths in food technology are recognized throughout the region but as the analysis indicates, other areas are also receiving attention. Small construction firms purchased technical advice. Servicing was purchased largely by food and chemical concerns, relying mainly upon ICAITI's well-equipped laboratories. With the arrival of a German financed textile technician, for example, ICAITI has been able to provide greater assistance in this area, now almost a traditional industry in Central America, at an increasing pace. Future ICAITI expansion into the paper field will be facilitated by a West German pilot plant for conversion of agricultural wastes into paper products. Increasing ICAITI activities in the energy and rural industry field will also strengthen its capacities to respond to specialized requests.

4. As discussed in the evaluation section of this paper, analysis of the quality of services raises technical difficulties as well as being costly. During Phase I ROCAP and ICAITI placed emphasis upon implanting an operational system capable of providing useful and needed services. Examples of PTT problem solving and the broad array of technologies developed and/or transferred by ICAITI are attached. They illustrate the technical breadth and depth that ICAITI brings to the PTT and that the PTT relies upon (Annexes 11 and 12).

Evaluations have confirmed ICAITI and our own conclusions regarding demand and usefulness -- however, these are indirect impressions. The evaluation section of this paper discusses future plans to enable ICAITI and ROCAP to better assess quality of services. For the present our confidence in quality of services rests on:

- Chamber of Industry support: The Chambers are the national sites of the PTT resident advisors. Their support will increase under the extension. In addition, at least two of the Chambers (Costa Rica and Nicaragua) have included the PTT as a separate and distinct service to the industrial sector in their Annual Directories, indicative of their independent views of the program.
- Evaluation: The recent positive Checchi and Company evaluation (CAPTO A-28) concluded, "Discussions and interviews with several organizations, past, present and future clients, and private businessmen indicates that PTT is becoming better known as is establishing a good professional reputation."

- ICAITI: From an institutional point of view, ICAITI would not consider reorganizing itself, nor would it be willing to undertake financial support for, a system of questionable worthiness. The PTT is changing ICAITI's perception of itself -- to a truly regional service organization -- and the way the region outside of Guatemala perceives it. Both are highly positive developments.

g. Institutional Linkages

The block diagram "Technology Transfer System" (Annex 7) shows a series of interrelationships, perhaps more complicated to illustrate than to implement, which comprise the PTT. In it ICAITI is shown to rely on its own technical resources and those of local, regional and international institutions to provide required services within the region. These institutions, described in Annex 7, for their own part may not even consider themselves technology resources, yet all share expertise or sponsor programs which support use or development of improved technology.

h. Relationship of the NTIS and PTT

The ongoing LA Regional Science and Technology Information Transfer Project with NTIS brings an important technical information resource to Central America. ICAITI is one of the Central American centers under this program. The PTT, where appropriate, uses the system to access relevant technologic information. NTIS training has also helped ICAITI improve its information management. NTIS' dependence upon "assistance groups, volunteer agencies and field agents" as stated in their 1977 project paper shows the importance the PTT outreach capability brings to the NTIS program which is complementary to the facilities NTIS brings to the PTT.

We note that the NTIS project paper contains funds for seminars; however, the work plan therein shows only one seminar per year for Central America. Accordingly, we see no conflict or duplication of effort.

i. Other Activities

The IDB finances a program of information transfer (SIATE) through the productivity centers in each C.A. country. ICAITI is the regional hub of this system. This service consists of one person located at the productivity center who is available largely as a reference librarian. The system does not actively visit industries or industrial groups on a regular basis and is largely a passive-response activity. Few, if any, services are performed beyond the information function. Users have to go to the productivity center for service. PTT uses SIATE as one source of technical information and is PTT's main connection into ICAITI's reference library.

B. Economic Feasibility^{1/}

1. Demand

(a) Size of the Market

According to the most recent data available (1968), medium-sized firms amount for about twenty percent of all industrial enterprises in Central America, and smaller firms for about sixty seven percent. Table II gives a rather conservative projection of the size distribution of firms as of 1977. Thus, there are many firms that fall into the PTT main target groups by size.

Future growth, expected to follow roughly the same pattern, will ensure a constantly enlarging market for PTT. Such a projection is not unreasonable. Real industrial value added has grown at an annual rate of 6.3 percent in the 1968-77 period in Central America, versus a 5.4 percent rate of real GDP growth.

TABLE II

SIZE DISTRIBUTION OF INDUSTRIAL^{2/}
FIRMS IN CENTRAL AMERICA: 1977

	<u>Small</u>	<u>Medium</u>	<u>Large</u>	<u>Total</u>
Costa Rica	630	212	73	915
El Salvador	1263	448	187	1898
Guatemala	858	293	130	1281
Honduras	398	150	59	607
Nicaragua	<u>350</u>	<u>137</u>	<u>69</u>	<u>556</u>
Total	3499	1240	518	5257

^{1/} The economic and, to some degree, financial analysis draw heavily from the work of Robert Maushammer, LA/DF/TFA economist who visited Guatemala in September, 1978.

^{2/} Methodology: 1968 data were taken as the base. Growth rates were assumed to be 2% per year for small firms, 2.5% per year for medium firms and 3% per year for large firms.

(b) Probable Shape of the Demand Curve

PTT representatives report that there is considerable sales resistance from the people they contact once the question of cost is brought into the discussion. ICAITI's other operating branches report similar experiences. They are mindful of the fact that they face stronger competition in some areas than in others.

If this experience can validly be extended to PTT-generated activities generally, it is probable that the demand curve for such activities is elastic, i.e. the level of sales depends strongly on the price charged.

2. Supply

ICAITI is a well regarded, relatively well-established Central American institution. Its capacities and recent undertakings are described in the institutional analysis section of this Project Paper. Of most immediate importance is that ICAITI still has financial and technical capability limitations. It is not, and should not be, all things to all people. As a result, ICAITI must set priorities.

One of the first outputs of the project was a special study by ICAITI to determine where PTT efforts should be concentrated. The study ranked the twenty manufacturing sub-sectors (as conventionally defined by the UN standard classification system) according to the following criteria:

- I. National or regional importance, specifically its priority in national development plans and its potential contribution to the development of natural resources.
- II. Economic importance of the sector, both now (measured by employees, value added and investment) and in the future (import substitution and export potentials).
- III. Capacity of the sector to accept technology transfers, including specifically the financial capacity to pay for technology and the technical capacity to use it.
- IV. Ability of ICAITI to provide assistance, based on present ICAITI capacity and contacts with the sector.

These criteria were arrived at after lengthy discussions within ICAITI and with outside consultants. Each criterion was then given a weight on a scale of 100. National/regional importance was given a weight of 56.6, economic importance was given a weight of 53.2, capacity of the sector

was given a weight of 100 and ICAITI capacity was given a weight of 93.3. Each industrial sector was then ranked against each criterion and an overall rating of sectors was derived. The adjusted* results for the six areas of highest priority are as follows:

TABLE III

Rank	Sector	Ranking by Criterion				Total
		I	II	III	IV	
1	Food Products	2.4	19.8	35.4	30.3	87.9
2	Chemical Products	7.4	5.8	11.7	14.8	39.7
3	Textiles	7.4	4.0	2.6	11.3	25.3
4	Paper Products	5.0	1.3	1.6	11.6	19.5
5	Metal Products	2.4	1.7	0.9	10.8	15.8
6	Leather Products	2.4	0.2	0.9	10.2	13.7
	Total	27.0	32.8	53.1	89.0	201.9

As can be seen from the above ranking, ICAITI ability to provide services was for all intents and purposes the real deciding factor. Some 45 percent (89.0 out of 201.9 points) over the overall scores were due to the influence of this one factor. This is important because ICAITI ability is the only supply factor among the criteria; the rest deal with demand. On the other hand, however, if the prioritization exercise excluded ICAITI capacity, only one significant change in rankings would have occurred -- wood (now number eight) would have changed places with metal products and become the fifth highest priority.

Mention should be made here that the prioritization was not meant to help decide which industries should be excluded from receiving PTT services. It is clear that exclusionary criteria are inappropriate in the light of what is actually happening: PTT effort is being concentrated on the sectors chosen for priority attention and on firms whose size indicates they are in the main target groups. This can be seen by comparing experience to date (shown in Table I).

* The adjustment dropped petroleum from consideration because no need for services was perceived.

3. ICAITI as a Business

ICAITI regards PTT as a sales tool, since in fact PTT does serve that function, and ICAITI should regard itself as a business, providing services, services that should be worth at least what they cost. No better measure of ICAITI's usefulness exists than the revenues it generates through its own activities.

ICAITI is now beginning to regard PTT as its sales arm. This will be encouraged, not only in seeking ways of expanding services in traditional areas and traditional markets, but also to move into new areas such as greater assistance to smaller firms.

If market forces dictate that ICAITI operate more like a business, then ICAITI will need to be managed so as to maximize revenues from sales. It would have to increase its marketing efforts (i.e., PTT) to increase market penetration and restructure its accounting to give better information to management on the true state of the business's finances.

4. Marketing Strategy

The need for, and general outlines of, a sensible market strategy were presented as part of the recent evaluation of PTT. Relevant portions of that study are reproduced below:

"(1) Marketing Approach

How to convert a potential client into an actual fee-paying client is a problem that bedevils many professionals in the business of selling services. Doctors, dentists, lawyers and the like have little trouble in this respect because their patients and clients recognize their need for the services and are used to the idea of paying hefty fees to get them. The purveyor of technical services to the small and medium size industry is rarely in such an enviable position.

Management of small and medium size industry in areas such as Central America are almost always non-professional, unspecialized, and in the hands of the owner and his family who do everything. If the business is keeping its head above water, the owner-manager believes that all is well and

that he is the master of his affairs. It is usually only when something is obviously wrong and he is more or less on the edge of disaster that he admits to himself the need for outside help. How then can ICAITI sell technical services to small and medium industry that might have an unrecognized need before the business is in severe difficulty?

We believe, on the basis of experience in similar situations in other parts of the world, that a short, relatively inexpensive general business check-up is a workable approach to the problem. In Central America it goes by the name of industrial diagnostic; in other places it may be called a management or operations audit -- the name is not important, but the price tag is. It must be modest in all respects: broad in coverage rather than intense, short in duration, and low in price -- yet a professional job that gives the client at least his money's worth and a taste for more. Above all it must reflect well on ICAITI.

There is a market for this kind of study as indicated by several requests for proposals that have come to our attention. ICAITI's present response to this market is a proposal -- usually drafted in an information and data vacuum -- that offers a multi-person, rather in-depth study at a price that runs to a thousand or two, or more, dollars. We submit that this kind of proposal to a first-time small-to-medium size prospect is inappropriate and premature. If one wants to catch a fish, one selects a proper hook and baits it with what appeals to the fish. ICAITI's bait is fine but the hook is too big for the fish to swallow. So he nibbles at the bait and then goes off. Not only is the proposal turned down, with all the consequent loss of effort and expense of contact, communications, and proposal writing, but ICAITI is not likely to see that prospect or his industrialist friends again.

The diagnostic we recommend is a one- to three-day affair -- depending on the size and complexity of the operation -- performed by one man at a price of a few hundred dollars, at most. It would serve to define the problem and suggest simple solutions where possible. It would leave the industrialist, if not with a solution, then with a more precise identification of what and where his trouble is. In many cases it would provide the information base upon which ICAITI could submit more pointed, relevant proposals for further study and action.

We suggest that the field representatives are the most likely people to perform these small introductory diagnostics as a low cost selling device to win more of the small-to-medium size industrial technology services market. They are technically trained people, capable in the food technology area where the largest part of the small-to-medium market resides, and are accustomed to recognizing and dealing with facts. They can easily be trained for this task by the SSE (Project Coordinator) who has done this training several times in other places. In the beginning the SSE may participate in the first few diagnostics until he is satisfied that the field men are ready to carry on alone. For some time longer it should be required that the diagnostic report to the client be reviewed by the SSE for content and appropriate presentation.

(2) Expanded Product Line

"... The PTT has been able to sell seven textile technical service jobs for almost \$34,000 ranging from a quick \$240 cost accounting assignment to a substantial \$25,000 general technical assistance contract still in progress. The furniture specialist has recently completed a \$6,000 general technical assistance contract with a firm in El Salvador. The field representatives report that it is relatively easy to sell such expertise and say that they could do more if there were a wider range of industry specific technical expertise readily available at ICAITI. Based on the experience to date in textiles and furniture we have every reason to respect their judgement.

It is likely that other industry experts could be available considering the apparent increase in interest in the transfer of technology among various bilateral and multilateral assistance agencies. The problem for PTT is to know precisely what kind and how many specialists it could effectively employ on the spot.

We recommend that SSE survey the regional market for the services of high level generalists in specific industrial sectors as exemplified by the textile and furniture specialists. In those cases where it appears fairly certain that the specialist could be substantially employed full time, ICAITI should approach interested donor agencies with a view to obtaining the assignment of such specialists as resident experts on ICAITI's staff for appropriate periods.

In the case of a need for a more narrowly specialized technician or for a generalist for shorter periods of service PTT will have to rely on its facilities for calling short-term specialists. At present the contracts with U.S. sources of technology are the only available vehicles for meeting this possible need."

In addition to changing its marketing approach and expanding its "product line", as recommended above, ICAITI should also have PTT set up sales targets for its field representatives, just like other sales organizations. This evaluation discusses what is needed:

"As far as we were able to detect, the marketing activities of the field representatives are under only general guidance and control. We saw no evidence of a tight marketing plan with quotas and targets for periodic achievement. Lacking these, it is pretty much up to the field representative to do as he wishes within the general guidelines of the strategy laid out by the SSE.

Impressive as the initial results seem to be, we believe that sustained and improved marketing performance will require more direction from the SSE. Without periodic targets and quotas - say, monthly targets for the number and kind of organizational and industrial contacts to be made and, perhaps, volume of sales concluded - the efforts of the field representatives remain undirected, except in the most general way, and without effective measures of performance.

There is no way at present to be satisfied that the field representatives are exerting their maximum effort and that their efforts are directed toward the goals of the PTT. In fact, the goals of the PTT need to be translated into near-term targets that can serve as the basis for specifications of what each field man should do in each country in the near term. There are no doubt many useful things a field man can do that would promote PTT success. It is up to the SSE to select among these for the activities that will do the job best -- to specify the amount and priority of each kind of activity. For example, how much of the time of the field representative in country X should be devoted in the next month or two to the mix of public relations, industrial contacts/sales, seminars, and other kinds of activity? We believe these trade-offs should be made by the SSE, and that the field representatives performance should be judged according to how well he carries out his marketing plan."

ICAITI is putting these recommendations into effect. Each year, prior to January 1, ICAITI will prepare an annual work plan incorporating the above suggestion. Special attention will be paid to establishing targets and quotas for small industry participation, specialized seminars, etc.

C. Beneficiary Analyses

1. The Problem of Small Firms

Perhaps most in "need" of ICAITI services and least able to pay for them, small firms represent a special problem both for PTT and ICAITI in general. They are difficult for PTT field representatives to reach.

Even if such efforts are unprofitable, ICAITI must service small firms as an important factor in industrial improvement in Central America. From a business point of view, sales to them could result in a contribution to reducing average costs per unit of service delivered. In addition, carefully kept records of assistance to small firms could be the basis of a strong, persuasive presentation to the Central American governments to request them to increase their financial support for ICAITI or to international agencies interested in spreading better technologies downwards among small firms. To be successful, however, such presentation would also have to show ICAITI's success in becoming more self-financing in other aspects of its operations.

The above is a reflection of the business-like seriousness with which ICAITI must treat all of its operations. Above all, ICAITI must be on a strong financial basis, so as to be less dependent on the vagaries of non-industrial revenues like government contributions and grants from international donors, and so as to better guarantee a continuation of its ability to serve in the future.

ICAITI projects that the five-man system will make over 600 contacts per year. At this rate, it would take over two years to contact all medium size firms, and over six years to contact all small and medium size firms thought to be operating in Central America at present, and proportionally more if repeat contacts are involved. Of these contacts, perhaps 300 will be only promotional and not result in the identification of a technology need. Of the remaining 300,

perhaps about half can be satisfied by a simple transfer of information. The other half are expected to be willing to pay for a service from ICAITI that they otherwise would not have sought.

<u>Recipient</u>	<u>Nature and Extent of Benefit</u>
User	Provided with information or other service. Value to user difficult to assess. In contractual situations, presumed to be above cost.
C.A. Government	External effects through expanded employment or savings of resources. Partially captured through tax system. Difficult to assess value of benefit.
A.I.D.	Establishment of PTT necessary to achieving A.I.D. goal of helping increase the welfare of C.A. citizens through spread of better technology. Extent of benefits to A.I.D. presumed to be lower than for C.A. governments'. PTT also useful in other programs beyond industry.
C.A. USAIDs	Strengthens regional source of expertise for backstopping of national efforts in small industry programs. Benefits vary from country to country.
Other Donors	Similar to A.I.D. Benefits less immediate, but see Annexes 10 and 17 for evidence of other donor interest.
ICAITI	PTT seen as necessary to increase productivity of existing fixed cost items, lowering total average costs of all services. ICAITI is agency of C.A. governments. Benefit at least equal to contribution to establish PTT.
Local Institution	Presence of PTT agent benefits membership. Size of benefit not known.
U.S. Institution	PTT strengthens both ICAITI and U.S. institution's research capability through cross pollenization. Benefits believed small at present.

Other Institutions (e.g. SIATE)	Complementary work, but potential source of competition in area of information only. Benefits thought to outweigh costs slightly.
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The valuation of PTT benefits or costs, or both, to all of these elements is somewhat dependent upon the social valuation of information now distributed (almost always at no charge if it is readily available) and the social valuation of the technologies themselves.

While it is easy to presume that a more accurate valuation of information would lead to a higher level of project benefits, it is not clear that the implementation of the technologies themselves will not involve divergence between private and social costs and benefits. There is in fact nothing that can be done during project design to preclude a misapplication of technologies, other than the knowledge that ICAITI is a Central American institution staffed by highly trained professionals who are very familiar with the local environment and who "screen" technology use into the area. Nevertheless, since the PTT (and ICAITI's) major focus is small firms, there is some reason to expect that any misapplications will have only minimal undesirable effects. In fact, however, it is not clear that the overall effect of the technologies would necessarily lead to a worse allocation of resources than at present and an improvement is, of course, still a distinct possibility as well as the intention.

D. Institutional Analysis

1. ICAITI. The Instituto Centroamericano de Investigación y Tecnología Industrial (ICAITI, officially known in English as the Central American Research Institute for Industry) is a non-profit regional organization founded in July 1955 by the five Central American Republics to advise and provide technical services to the region's industrial sector and to conduct appropriate technical research on products and processes utilizing regional raw materials and natural resources. It has been in its present Guatemala facilities, donated and maintained by the Government of Guatemala, since March 1957.

ICAITI's fundamental objectives are:

- to advise the private sector in all phases of industrial feasibility studies and their execution;

- to advise and assist private firms in solving any production problems that they might encounter;
- to undertake technical experiments using regional raw materials, develop production methods, design new products and adapt modern production techniques;
- to promote the adaptation and adoption of modern technology to improve Central American industrial productivity;
- to advise public and private industrial development institutes and investment institutions;
- to develop Central American standards for raw materials, intermediate and finished goods;
- to conduct quality control analyses, tests and trials for raw materials and products.

ICAITI's facilities cover 6485 square meters where the staff of 135 personnel, including 64 professionals, are employed. Professional personnel cover such fields as chemical, industrial and mechanical engineers, chemists, biochemists, microbiologists, geologists, mathematicians, industrial economists and technicians in various fields. ICAITI's facilities include:

- an organic chemistry laboratory;
- an inorganic chemistry laboratory;
- a leather technology laboratory;
- a laboratory and pulp and paper pilot plant;
- a laboratory and textile pilot plant;
- a food technology laboratory;
- an industrial microbiology laboratory;
- a special analysis laboratory equipped with an atomic absorption spectrophotometer, an ultraviolet and visible spectrophotometer, an infrared spectrophotometer, a mass spectrophotometer and various gas chromatographs.
- an up-to-date reference center and research service.

ICAITI is divided into the following divisions (a full organization chart is exhibited at Annex 14).

a. Applied Research. This division conducts food technology work and studies processes designed to exploit regional, especially agricultural, natural resources.

b. Technical Industrial Services. Marketing, technical and economic feasibility studies, cost control, process expansion, raw material availability, productivity and other economic and industrial engineering activities are conducted by this division. Use of sugar alcohol produced from sugar as a partial gasoline substitute is under current investigation here.

c. Standards. ICAITI has developed regionwide standards for a variety of manufactured industrial products. It also acts as a reference laboratory to help maintain standards for a variety of exports which have to meet foreign standards.

d. Applied Geology. This division assists and advises on geological resources and potential for mineral exploitation in the region.

e. Analysis, Testing and Trials. A variety of work in food, textiles, leather, paper and cartons, synthetic industrial resins, use and control of insecticides, pesticides and environmental contamination is carried out by this division.

f. Science and Technology. The PTT is presently coordinated in this division which conducts applied studies and special training programs using resources of other divisions in applied science and technology.

g. Documentation and Information. Information storage, research, and retrieval are provided from this division using ICAITI's own library and a variety of other information resources.

h. Technical Publications. This division publishes popular, technical and research studies for the general public, industrial sectors and specific industries or other clients.

Annex 10 lists ICAITI's current activities related to appropriate or light capital technology development. In addition, ICAITI's major activities involve:

a. Conducting studies on production processes with particular emphasis on the use of local raw materials.

b. Assisting industries and other businesses in the technical aspects of start-up and operations including the solving of technical problems, reduction of production costs, improvement of production techniques, and the raising of quality standards.

c. Preparing, publishing and disseminating technical information to the producers in the region.

d. Training personnel in technical aspects of industrial production.

2. PTT Administration/Coordination. Management and coordination of the PTT is the responsibility of the sales engineer. A PTT coordinating committee consisting of ICAITI's Director, Assistant Director, and various division chiefs, meets regularly to coordinate activities and review ITT activities in progress. Field representatives participate in monthly meetings at ICAITI during which they review their activities with particular divisions in order to improve operations.

Three of the field representatives and the sales engineer budgeted in the revised financial plan are already contract employees of ICAITI. Two additional field representatives will be recruited, trained and assigned (to Honduras and Nicaragua) as soon as possible.

Representatives will continue to be located within Chamber of Industries Offices.

ICAITI is currently reviewing the organizational structure of PTT with a view towards establishing it as a separate "sales" unit within the organization, and responsible to the Director's office.

3. How Important is PTT to ICAITI?

PTT is of such importance to ICAITI that it is prepared to absorb the costs of the programs after ROCAP funding ceases. This willingness is based on the fact that the PTT program provides a high potential for ICAITI to reach more

technology users. It is estimated that by March, 1981, this program will be generating annual contracts for ICAITI of more than US\$420,000. As can be seen in Annex 18 (PTT effects on ICAITI's Break Even Point), the investment of US\$6,600 monthly (estimated cost of PTT to ICAITI after system is in place), can place ICAITI at a higher potential for more of its services. It is estimated that with PTT, ICAITI can increase its sales by at least US\$35,000/month.

The PTT facilitated contacts with U.S. universities are beneficial to ICAITI in both direct and indirect aspects. ICAITI by combining its capabilities with the capabilities of contracted U.S. universities obtains a better image among the users of its technical capacity. These contracts enable ICAITI to expand its activities into different areas. ICAITI also benefits from the contracted specialists that come to Central America to execute tasks. This is because ICAITI provides counterpart employees that directly benefit by the know-how and experience of the contracted consultants. ICAITI also obtains direct benefits from these universities since the universities contract ICAITI for different tasks.

E. Financial Analysis and Plan

1. History of Project Funding

To date, project funds have been obligated in the following manner for operations through September 30, 1979:

FY 1976	\$100,000
TQ	120,000
FY 1977	90,000
FY 1978	<u>183,000^{1/}</u>
Sub-total	<u>\$493,000</u>

We estimate future requirements as follows:

FY 1979	\$250,000
FY 1980	<u>510,000</u>
Sub-total	<u>\$760,000</u>
Total Project Cost	<u><u>\$1,253,000</u></u>

1/ Partial funding only.

The extension proposed in this revision requires an increase in Phase II from 18 months (i.e. through March 1980), to 30 months (through March 1981).

2. Financial Analysis

During the period 1975-1977 ICAITI's executed actual budgets were as follows:

	(US \$000)		
	For the Years Ending December 31		
	<u>1975</u>	<u>1976</u>	<u>1977</u>
Personal Services	\$ 961.3	\$ 890.6	\$ 909.0
Training Scholarships	9.4	3.3	4.2
Equipment, Materials and Supplies	95.9	71.2	73.6
Operating Expenses - Miscellaneous	141.7	120.9	138.1
Emergencies	--	3.0	--
Total	<u><u>\$1,208.3</u></u>	<u><u>\$1,089.0</u></u>	<u><u>\$1,125.0</u></u>

Of the above executed budgets, about 20% in 1975 and 34% in 1976 and 1977 was covered by pledged subsidies from the Central American Governments.

As shown in the following table, subsidies from the five Central American Governments have increased over 38% during the period 1975-1977.

Country	Subsidy Amount		% Increase	Amount Due ^{3/} 12/31/77
	<u>1975</u>	<u>1977</u>		
Guatemala	\$ 80 ^{1/}	\$100	25	--
El Salvador	52	75	44	--
Honduras	52	75	44	\$ 46
Nicaragua	52	75	44	254
Costa Rica	52	75	44 ^{2/}	34
Total	<u><u>\$288</u></u>	<u><u>\$400</u></u>	<u><u>39^{2/}</u></u>	<u><u>\$334</u></u>

^{1/} Includes extraordinary contributions

^{2/} Not additive.

^{3/} See Annex 15 for a status of CA government contributions through 7/31/78.

ICAITI plans to request an increase in subsidies from each country in 1978. Unsettled political conditions in Central America have required several postponements of meetings of ICAITI's Board of Directors. This item will be on the agenda of the next meeting. However, if approved, such increases would probably not become effective for at least a year.

Annex 16.a exhibits ICAITI's Condensed Balance Sheets for the years ended December 31, 1975, 1976 and 1977. During the period 1976 and 1977 the Balance Sheet increased over 12% from \$2.2 million in 1976 to \$2.4 million in 1977. Most of this increase (76%) is attributable to a larger volume of Projects in Process at the end of 1977.

Annex 16.b., Comparative Income Statements for the years 1975 through 1977, reflects decrease in revenues as well as a constant increase in costs relating to contracts, projects and programs. The decrease in revenues can be attributed mostly to ICAITI's accounting practice of not recognizing income from projects until they are completed which, coupled with the lesser volume of contracts actually completed during 1977, contributed to a reduction in income reported. The increase in costs in 1977 is a reflection of the accounting practice followed by ICAITI wherein non-project-related divisional costs (promotion, training, research, seminars, etc.) are considered as direct costs of completed projects during that year. Accordingly, if the value of projects completed during any one given year is reduced considerably, the absorption of non-project related divisional costs is proportionately greater, thus accounting for the apparent increase in the costs of completed projects. A detail of actual income generated through contracts, projects and programs and costs related thereto for 1975 through 1977 and projected for 1978 follows:

(U.S. \$000)

Year	Income	Cost			Net Cost to ICAITI	
		Project Related	Non-Project Related	Total	Amount	%
1975	\$1,139	\$1,015	\$ 428	\$1,443	\$ 304	27
1976	940	1,053	280	1,333	393	42
1977	411	550	318	868	457	111
1978*	1,230	1,778	100	1,878	648	53

* Projected by ICAITI based on activities in process at 12/31/77.

Approximately 91% of ICAITI's total costs are identified with the costs of services relating to contracts, projects and programs. The gross revenues generated by contracts and grants are not sufficient to absorb all the costs associated therewith. This condition exists because only the direct costs of most projects are financed through contracts and grants while indirect costs are covered totally or in part by ICAITI's own resources (i.e. mainly government subsidies). If ICAITI is to continue operating at its current level it will require an increase in contributions. The alternative would be to reduce costs which would most likely reduce the ability of the Institute to conduct certain types of work because of lack of expertise. That ICAITI's work requires expertise in a number of fields is illustrated in Annex 17 which shows activities underway at the end of 1977 and activities contracted subsequent to that date. The wide variety of activities shown appears to preclude any significant staff reduction at the present time.

A summary by sector of the value of contracts listed at Annex 17 is shown in the following table.

(U.S. \$000)

<u>Sector</u>	<u>Activities</u>		<u>Total</u>
	<u>In Process at 12/31/77</u>	<u>Contracted 1/1/78 - 6/20/78</u>	
Public	\$ 288	\$ 108	\$ 396
Private	110	91	201
International Organizations	<u>423</u>	<u>677</u>	<u>1,100</u>
Total	<u>\$ 821</u>	<u>\$ 876</u>	<u>\$1,697</u>

3. ICAITI's Accounting System

ICAITI accounts for all transactions through charges and credits to operational units. All income as well as expenses, both direct and indirect, are charged to these units. Individual projects are accounted for by cost elements within each project, e.g., personal services, materials and supplies, other direct costs, indirect costs, etc.

The basic operational units within ICAITI are as follows:

- a. Applied Research
- b. Technical Industrial Services
- c. Standards
- d. Applied Geology
- e. Analysis, Testing and Trials
- f. Science and Technology
- g. Special Projects

The Special Projects Division is responsible for projects of a multidisciplinary nature requiring the participation of several units and for projects which are not identifiable directly with other units. The PTT system is currently accounted for under the Special Projects Division because of the involvement of several units in its implementation. Contracts and projects generated by the PTT project are accounted for within the specific operation units charged with their implementation. This is because the PTT system is considered more of a promotional than an income-generating unit.

After all individual project transactions have been posted to their respective cost units they are consolidated in General Ledger accounts for Financial Statement presentation.

Although the PTT system is currently being accounted for as a separate project within ICAITI, as the system (PTT) becomes fully operational, it will become a part of ICAITI's total operations. This will result in all costs for the administration of the system being applied to each division based on its total salary costs.

ICAITI's accounting system allows for income generated as well as expenses incurred to be readily identified not only by the unit responsible but also by individual projects and cost elements therein.

ICAITI establishes its costs of services performed by adding direct costs e.g. salaries, travel and per diem, etc., and indirect costs (overhead-currently 80% of total salaries).

After the PTT system becomes fully operational ICAITI intends to continue costing projects in basically the manner described above. The only major change will be that indirect

costs to be charged will include not only ICAITI's total costs of non-operational units but also those fixed costs of the PTT system. Under this procedure the PTT will be considered part of ICAITI's total operations and not part of a separate unit. It is expected that this will effectively institutionalize the system and result in lowering the costs of PTT services to the end users. This cost savings to end users will occur because all units within ICAITI will absorb a portion of the fixed costs involved in managing the system.

4. Financial Viability of the PTT

The following table reflects total monthly expenses to maintain the PTT system after ROCAP funding ceases in March, 1981. Total expenses are estimated at \$156,300 per year of which ICAITI will pay \$79,200 and other participating institutions \$77,100. The fixed cost for the maintenance of the PTT paid by ICAITI will be charged to the users of ICAITI services as part of the indirect costs.

Total Monthly Expenses after PTT System is in Place

	<u>Expenses</u>	<u>To be Paid by</u>	
		<u>ICAITI</u>	<u>Others</u>
Project Director and Coordinator	1,000	1,000	-
Field Representatives	6,875	4,000	2,875
Secretarial Support (local and field)	850	200	650
Mileage	300	150	150
Communications	300	150	150
Travel and Perdiem	1,000	800	200
Office Supplies	250	100	150
Training field representatives	250	100	150
Promotional material	400	100	300
Indirect cost	<u>1,800</u>	<u>-</u>	<u>1,800</u>
	TOTALS	<u>6,600</u>	<u>6,425</u>
Yearly	<u>156,300</u>	<u>79,200</u>	<u>77,100</u>

Annex 18 provides an analysis of ICAITI's actual and projected cash income and projected breakeven point (i.e. \$79,200 income) when PTT "sales" and ICAITI contract operations reach \$1,224,000 annually. For 1978, ICAITI projects revenues

of \$1,230,000. However, this was based upon the expectation that the PTT would become fully operational in all five countries in mid-1978. The delay in expansion will have a negative impact on the projections.

5. Financial Plan

The costs of Phase II will total approximately \$1.5 million, of which \$909,000 will be provided by AID and \$551,000 by ICAITI as counterpart to the project. AID expenditures will cover a 30-month period from October 1, 1978 through March 31, 1981. ICAITI's expenditures will cover a 39 month period from October 1, 1978 through December 31, 1981. During the last nine months of this period, ICAITI will assume all obligation for payment of services.

Tables IV, V and VI (Financial Plan, Projection of Expenditures, and Summary Cost Estimates, respectively) reflect Project budgeted costs by inputs, by cost elements and by foreign exchange and local currency. These tables are shown in pages 45,46 & 47. A summary of projected costs and elements to be financed is as follows:

<u>Project Elements</u>	<u>Projected Costs</u>		
	<u>Source</u>		<u>TOTAL</u>
	<u>AID</u>	<u>ICAITI</u>	
Technical Assistance (U.S.)	\$ 118	\$ -	\$ 118
Technical Assistance (Local)	192	148	340
Contract Services	145	89	234
Training and Workshops	25	22	47
Other Costs	<u>346</u>	<u>242</u>	<u>588</u>
Sub-Total	\$ 826	\$ 501	\$1,327
Inflation	83	50	133
Project Total	<u>\$ 909</u>	<u>\$ 551</u>	<u>\$1,460</u>

Within AID's contribution the U.S. Technical Assistance project element will provide:

- a) 30 person-months of assistance to coordinate management and direct PTT activities; and
- b) 7.5 person-months of assistance to advise ICAITI on administrative matters related to the implementation of the project.

The Local Technical Assistance project element will provide 156 person months of assistance to:

- a) identify and contact technology users in each of the five Central American countries;
 - b) channel technology needs to backstop sources;
 - c) insure proper delivery of technological packages;
- and
- d) assist the project coordinator in all project activities.

The Contract Services element will provide funds to cover:

- a) the contracting of U.S. Universities (Georgia Tech, Denver Research, Consortium of Universities, etc.) and other institutions to solve specific problems during the project implementation for which the necessary technology is not available within the Central American region; and
- b) two evaluations and the salary of the project coordinator's secretary.

The Training and Workshops element will provide funds to cover:

- a) U.S. training for two new field agents in the techniques of problem identification and solution; and
- b) instructors, facilities and per diem costs of seminars for personnel supporting the outreach mechanism, to improve institutional working relations and coordination for technology transfer.

AID-funded indirect costs of \$176,000 were arrived at by applying a percentage factor (80%) for specific AID-funded direct salaries for local technical assistance personnel and the project coordinator's secretary, while ICAITI's \$190,000 of indirect cost contribution was arrived at by applying 40% of U.S. management advisors' cost and 80% of project coordinators' cost and ICAITI's project-funded local personnel for the first 30 months. These percentages are based on rates used by ICAITI for budgeting purposes.

ROCAP funding will decrease in the second year of the extension to 75% of direct PTT costs and then 25% in the remaining period, with ICAITI assuming full costs thereafter.

TABLE IV

ICAITI
PROJECT FINANCIAL PLAN
(U.S. \$000)

	Period						Project Phase II Total		
	10/1/78-10/31/79			11/1/79-12/31/81			AID	ICAITI	Total
	AID (13 mos)	ICAITI (13 mos)	Total	AID (17 mos)	ICAITI (26 mos)	Total			
<u>Project Specific Inputs</u>									
Personnel Trained and oriented	22	7	29	20	21	41	42	28	70
Organization/System Refined	287	68	355	356	234	590	643	302	945
Coordination of Participating Organizations	54	67	121	87	104	191	141	171	312
	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>
Total	363	142	505	463	359	822	826	501	1327
Inflation (10%)	<u>36</u>	<u>14</u>	<u>50</u>	<u>47</u>	<u>36</u>	<u>83</u>	<u>83</u>	<u>50</u>	<u>133</u>
PROJECT TOTAL	<u>399</u>	<u>156</u>	<u>555</u>	<u>510</u>	<u>395</u>	<u>905</u>	<u>909</u>	<u>551</u>	<u>1460</u>

TABLE V
ICAITI
PROJECT FOR THE TRANSFER OF TECHNOLOGY
PROJECTED EXPENDITURES AND FUNDING REQUIREMENTS
(U.S. \$000)

	10/1/78-10/31/79			11/1/79-12/31/81			Project Total			AID Funding Requirements		
	AID (13 mos.)	ICAITI (13 mos.)	Total	AID (17 mos.)	ICAITI (26 mos.)	Total	AID	ICAITI	(Extension) Total	Covered by ProAg 78-5	Difference to be Covered FY 79	FY 80
Technical Assistance (U.S.)												
Project Coordinator	43	-	43	57	-	57	100	-	100	17	26	57
Management Advisor	5	-	5	13	-	13	18	-	18	-	5	13
Total	<u>48</u>	<u>-</u>	<u>48</u>	<u>70</u>	<u>-</u>	<u>70</u>	<u>118</u>	<u>-</u>	<u>118</u>	<u>17</u>	<u>31</u>	<u>70</u>
Technical Assistance (local)												
Five Field Representatives	60	-	60	93	87	180	173	87	260	45	35	93
Administrative Assistance	8	-	8	11	4	15	19	4	23	-	8	11
Project Director	-	7	7	-	16	16	-	23	23	-	-	-
Information Services	-	14	14	-	20	20	-	34	34	-	-	-
Total	<u>68</u>	<u>21</u>	<u>109</u>	<u>104</u>	<u>127</u>	<u>231</u>	<u>192</u>	<u>148</u>	<u>340</u>	<u>45</u>	<u>43</u>	<u>104</u>
Contract Services												
U.S. Universities	22	-	22	48	-	48	70	-	70	-	22	48
Institutions	10	-	10	17	-	17	27	-	27	-	10	17
Secretarial Assistance	13	-	13	15	13	28	28	13	41	4	9	15
Backup Technical Support to Contractor	-	33	33	-	43	43	-	76	76	-	-	-
Evaluations	-	-	-	20	-	20	20	-	20	-	-	20
Total	<u>45</u>	<u>33</u>	<u>78</u>	<u>100</u>	<u>56</u>	<u>156</u>	<u>145</u>	<u>89</u>	<u>234</u>	<u>4</u>	<u>41</u>	<u>100</u>
Training and Workshops												
Training of Field Representatives	5	2	7	6	6	12	11	8	19	-	5	6
Seminars and Workshops	8	5	13	6	9	15	14	14	28	2	6	6
Total	<u>13</u>	<u>7</u>	<u>20</u>	<u>12</u>	<u>15</u>	<u>27</u>	<u>25</u>	<u>22</u>	<u>47</u>	<u>2</u>	<u>11</u>	<u>12</u>
Other Costs												
Travel and Per Diem	49	2	50	43	29	72	91	31	122	41	7	43
Communications	20	-	20	19	8	27	39	8	47	-	20	19
Office Supplies	13	-	13	12	6	18	25	6	31	-	13	12
Promotional Materials	6	-	6	6	6	12	12	6	18	-	6	6
Library Acquisition	1	-	1	2	1	3	3	1	4	1	-	2
Indirect Costs	81	79	160	95	111	206	176	190	366	39	42	95
Total	<u>169</u>	<u>81</u>	<u>250</u>	<u>177</u>	<u>161</u>	<u>338</u>	<u>346</u>	<u>242</u>	<u>588</u>	<u>81</u>	<u>88</u>	<u>177</u>
Sub-Total	363	142	505	463	359	822	826	501	1327	149	214	463
Contingency and Inflation (10%)	36	14	50	47	36	83	83	50	133	-	36	47
TOTAL	<u><u>399</u></u>	<u><u>156</u></u>	<u><u>555</u></u>	<u><u>510</u></u>	<u><u>395</u></u>	<u><u>905</u></u>	<u><u>909</u></u>	<u><u>551</u></u>	<u><u>1460</u></u>	<u><u>149</u></u>	<u><u>250</u></u>	<u><u>510</u></u>

TABLE VI

ICAITI
SUMMARY COST ESTIMATE
(U.S. \$000)

<u>Cost Element</u>	<u>AID</u>		<u>ICAITI</u>	<u>Total</u>		<u>Project Phase II</u> <u>Total</u>	
	<u>EX</u>	<u>LC</u>		<u>TOTAL</u>	<u>LC</u>		<u>EX</u>
Technical Assistance (U.S.)	118	-	118	-	118	-	118
Technical Assistance (Local)	-	192	192	148	-	340	340
Contract Services	90	55	145	89	90	144	234
Training and Workshops	11	14	25	22	11	36	47
Other Costs	-	346	346	242	-	588	588
Sub-Total	219	607	826	501	219	1108	1327
Inflation (10%)	22	61	83	50	22	111	133
PROJECT TOTAL	<u>241</u>	<u>668</u>	<u>909</u>	<u>551</u>	<u>241</u>	<u>1219</u>	<u>1460</u>

F. Environmental Concerns

The Initial Environmental Examination for the project was submitted to AID/W on August 14, 1978 (GUATEMALA cable 4758). The examination concluded that the project would not have a significant effect on the human environment and ROCAP therefore recommended a Negative Determination. The LAC Bureau's Development Assistance Executive Committee concurred with ROCAP's recommendation, and the Assistant Administrator for Latin America and the Caribbean determined that the project is not an action for which an Environment Impact Statement or an Environmental Assessment is required pursuant to Title 22, Part 216.4a, Environmental Procedures, signed September 11, 1978.

G. Proposed Time-Frame

The final evaluation of Phase I recommended a Phase II length of up to 42 months in view of several considerations. Principal among these was the recognition of the project's late start. This refers not only to the numerous startup problems and delays which were to be expected in some degree, but more importantly to the delayed discovery of the critical need for a senior sales engineer as a sine qua non of fruitful project operations. This engineer has been on the job for only nine months and, while his contribution to project coherence, direction, and increased momentum has been considerable, the evaluators felt substantially more time was needed for strengthening by ICAITI of all aspects and potentialities of the project.

Other concerns suggesting a Phase II period longer than the 18 months originally conceived include the following:

1. Project Staff Maturity. The need for time to establish the full project staff is considered important. Additional field representatives are scheduled to be recruited not later than the end of 1978. Their basic training in the United States is scheduled for March, 1979. Only then will they begin in earnest the work to develop the project fully in their respective countries including an initial period of some months to establish the working relationships needed with national agencies. Related to this concern is the time needed to organize and conduct the seminars and workshops for national participants.

2. Extra-Regional Sources. Phase II entails ICAITI's establishment of working relationships with additional technology agencies outside the region as sources for particular

technologies needed within the region. Experience in Phase I has shown that this can be a time-consuming process, not only to identify a likely source and establish a contractual relationship, but, equally importantly, to test the source for utility of technologies deliverable and, critically, the speed of deliveries (some otherwise valuable sources in the United States have taken up to four months to deliver requested technological assistance; and, in one case where an agency's services proved unacceptable, it took almost a year for the established relationship to be terminated and the funds committed freed for application to other agencies' services). Thus sufficient time is needed for the international canvassing and weeding out process among potential extra-regional sources.

3. Industrial Sector Expansion. In ICAITI's initial analysis of the region's industrial sectors, six were selected for priority project attention from the 20 industries surveyed. At the top of the priority list was food processing. In Phase I this industry has received priority attention and the preponderance of technologies delivered have been to industrial clients in this sector. In Phase II ICAITI will move beyond this sector to focus more on other priority industrial sectors, but this will entail the development of new technology sources, new industrial analyses, re-orientation of the field representatives, and perhaps acquisition of additional technical staff at ICAITI if demand so indicates, all considerations posing extra time requirement .

Thus ROCAP agrees with other observers that more than 18 months is needed to insure sufficient time for the project to come up to full operational speed, assume its long haul posture, become financially self-sufficient and be fully institutionalized within ICAITI to continue as a routine activity beyond the end of AID support. At the same time, ROCAP's best judgment (with which ICAITI is in agreement) is that 30 months offers adequate time to accommodate the various concerns cited above and to insure that the technology transfer process is well grounded.

II. Women in Development

ICAITI actively seeks and employs women professionals in its various programs; e.g. the head of its information division is a woman. Selection of field agents is by open competition. Special efforts will be made to such qualified women candidates for the two new positions. PTT activities, as such, will be increasingly focused on small industry technology problems. These are mainly labor-intensive and many of them given ICAITI's strong expertise in the area, are food technology oriented. This is an area where women have traditionally been the major source of employment for processing, packaging, etc.

I. RELATIONSHIPS TO CA USAID PROGRAMS

ICAITI major contacts are with host country public and private sector institutions. The PTT locates its field agents within the local Chambers of Industry, thus implying a purposeful orientation to the private sector, as opposed to C.A. USAID programs which in the main are largely public sector connected; however, there is a growing emphasis among them on rural industries and technology. Accordingly, there are few present direct links between ICAITI and on-going USAID activities; however, there is potential for future projects. Annex 7 shows institutional linkages between ICAITI and Central American institutions, and Annex 8 provides country profiles of indicative work done by the PTT in each. The following is a list of on-going or proposed C.A. USAID programs which may be able to draw upon ICAITI services. In general, there is significant potential for cooperation in Costa Rica and El Salvador. Nicaragua and Honduras (where the two new agents will be based) offer longer term potential. Guatemala, as the site of ICAITI, may involve a significant ICAITI role in rural industry development.

1. Costa Rica

(a) Natural Resources (0145). This project includes creation of a natural resource base information system. It also initiates and sponsors investigation of natural resource problems. The project will work through several GOCR institutions, including the universities. PTT has working relationships with the University of Costa Rica and the Cartago Institute of Technology and will assist, as appropriate, in connecting the information system envisioned with relevant information located at ICAITI (and other C.A. countries). The degree of involvement, however, is not expected to be great.

(b) Agro-Industry (0148). The proposed loan includes, inter alia, feasibility studies in target agro-industries. CODESA may manage the project. PTT works with CODESA, and ICAITI, given its expertise in food technology, may assist CODESA in these studies.

(c) Science and Technology (0138). This proposed loan to CONICIT supports activities in agroindustries, small and medium scale industries, natural resources, environmental protection, and energy. All of these are also of high priority with ICAITI. CONICIT has good working relations with the PTT field representative (in fact, CONICIT requested him to move from the Chamber of Industry to CONICIT's offices). The field representative has assisted CONICIT in working on this project and it is expected that ICAITI's relevant experience will be called upon, as appropriate. The PTT will integrate the proposed research information system under the project into ICAITI and other extra-country sources.

2. Nicaragua

(a) Rural Development Sector Loan II (0138) includes small rural enterprises support through INVIERNO. ICAITI does not yet have working relationships with INVIERNO; however, the new field representatives will seek ways to assist INVIERNO in the project.

(b) Rural Cooperatives. There are several OPG's proposed for work in cooperative development. Several (Small merchants credit union, cooperative development support, etc.) provide excellent opportunities for PTT to provide technology transfer services.

3. El Salvador

(a) Rural Enterprise and Cooperative Development (0213). This proposed activity will work through two Salvadoran institutions with which PTT has close working relations - FIGAPE and INSAFI.

(b) Central Marketing Cooperative (0216). Working through the National Federation of Small Enterprises (FENAPES), this proposed OPG supports technical assistance for export of small enterprises production. PTT works with COEXPORT and will provide assistance, as appropriate. ICAITI is the region's "Bureau of Standards" and provides assistance in meeting export quality standards.

4. Honduras

USAID/H has a policy of actively promoting greater involvement of the private sector in the development process (FY 78 DAP). Rural industries are an important part of that strategy.

(a) Small Farmer Technologies (0123). This project, inter alia, proposes technical support to small rural entrepreneurs for fabrication of local prototypes. ICAITI has performed several studies in this area and may be able to provide complementary assistance, as appropriate.

(b) Agro-Industrial Export Development (0120). This multi-institutional project promotes small farmer exports. The CCTI is one institution involved and is a cooperating agency of the PTT. A resident field agent will significantly strengthen ICAITI's capabilities to support this activity.

5. Guatemala

There are two activities where PTT may provide some assistance (although, as the site of ICAITI, Guatemala has ready access over a wide area of activities):

(a) Small Farmer Marketing System (0238). This is a cooperative project to export small farm produce. ICAITI is a testing laboratory for quality standards and is used by most exporters.

(b) Rural Enterprise Development (0245). ICAITI is specifically listed as a potential source of technical assistance for this project. The PTT representative provides a ready reference point for ICAITI action. In addition, ICAITI works closely with INTECAP (local productivity center) in small industry promotion under this loan.

V. IMPLEMENTATION AND EVALUATION PLANS

A. Implementation Plan

As soon as Phase II is approved, ROCAP and ICAITI will execute a project agreement covering the funding requirements of the next 13 months of project (see Annex 6 for a Summary Activity schedule). The first order of business will be recruitment to expand the project staff. Already ICAITI has identified several possible candidates for the two new field representative positions, and other candidates are actively being sought out. Thus these positions will be filled no later than early January, 1979. The new field representatives will be given an initial orientation followed by several weeks on-the-job training as they settle into their new posts (one in Honduras, one in Nicaragua), set up their offices in the local chambers of industry, and begin making their basic contacts. In March, 1979, they will go to the United States for their formal training at GIT, DRI, and/or other similar institutions for two-four weeks.

ICAITI also is currently looking for a candidate for the position of administrative assistant to the project coordinator and this position will be filled at an early date.

Prior to January 1, 1979 and annually thereafter, ICAITI will prepare an annual work plan for all PTT activities projected for that year.

Other project activities will essentially continue those begun during Phase I but on a broader scale, and more narrowly focussed (to the extent possible) on small industry requirements. ICAITI will organize and conduct periodic workshops and seminars for various participants. The expanded

staff of field representatives will make new contacts among potential clients, identifying technology needs and initiating actions locally, regionally, or abroad to satisfy those needs. Additional extra-regional sources of technology will be sought out and supporting relationships established as appropriate.

As ICAITI moves to fully insitutionalize the activity, the field representatives will be converted to permanent status on ICAITI's staff.

ROCAP Administration

ROCAP's Program Officer is serving as project manager for this activity. This arrangement has proven satisfactory in monitoring AID budget support and in overseeing project activities through regular and close liaison with ICAITI's project coordinator who is stationed at ICAITI headquarters in Guatemala. ROCAP's FY 1980 ABS includes the position of a Science and Technology Adviser who would manage the project, as well as other proposed activities in LCT and non-conventional energy. He would also provide similar services to other C.A. USAID's, as appropriate.

So long as it maintains its present configuration, ROCAP will continue those administrative arrangements which have proved effective in practice.

Negotiating Status

ROCAP has worked closely with ICAITI personnel in preparing this paper. The baseline analysis was developed by ICAITI personnel with assistance from ROCAP. The letter of application from ICAITI (Annex 2) reflects their intention to insitutionalize the PTT within ICAITI and make it self-sufficient upon Central American sources of funding after Phase II. The letter also confirms ICAITI's desire to significantly insure the focus of the PTT upon the needs of small industries. Finally, the letter confirms ICAITI's intention to provide approximately \$551,000 to Phase II.

B. EVALUATION PLANS

1. Evaluation of Impact

The evaluation of the impact of proposed technology transfer activities to be carried out in Phase II poses a challenge for a system that deals in information transfer. The

benefits that accrue to any user may or may not be attributable exclusively to the specific information received. Unlike a credit or good received, information may only pass a user on to a potential benefit, rather than produce a benefit unto itself.

Any requirement such as recording baseline data prior to initiation of a study or service (similar to a requirement under AID loans to the Latin American Agribusiness Development Corporation - LAAD) would be highly counterproductive to the goal of expanding sales to insure financial self-sufficiency for the PTT. In many cases, such as information transfer, the system would be impracticable. The cost of collecting such data is also a factor. How much should ICAITI spend on evaluating a \$1,500 contract or a request for technical information?

Finally, the PTT, in many ways, is indiscriminate in its subject matter. The range of possible activities reaches across the entire industrial sector and any attempt to systemize and correlate results would run the risk of a meaningless comparison.

This does not preclude the establishment of an improved system for recording the number, nature, and scope of PTT services requested and provided. Such a system has been lacking until quite recently. The Sales Engineer has designed such a system and field representatives are being trained in its use. Annex 19 provides an example of this reporting system format. This form will now be used to record all PTT activities initiated at the field agent level. (Unfortunately, the lack of such a system to date has resulted in many PTT

activities going unreported. For example, many of the services provided by ICAITI through the PTT network in the area of testing were not recorded separately. They simply "disappeared" within ICAITI's overall accounts and have proven impossible to track. The installation of the reporting system is a direct result of having attempted to determine the impact of these services and the resulting difficulty.) The use of this system will finally allow ICAITI (and AID) to fully appreciate the extent of services provided by the PTT. However, we recognize that while a more precise view of services provided will be available, it will not be able to provide the qualitative aspect necessary for a systematic evaluation of impact.

Accordingly, ROCAP proposes that the two evaluations include an attempt to address the impact question by the random sampling of PTT users in the various fields and direct interviewing to establish a subjective judgment on how the PTT has benefited their particular situation. ICAITI and ROCAP will agree upon a list of PTT users which provide a cross section of the target group of small and medium industries, including a representative sampling of different types of industries.

At the same time, for those activities which the PTT sponsors such as conferences and seminars for small businessmen, work with cooperatives, introduction of new techniques and technology under specialized programs (e.g., rural industries), then each activity will include an attempt to establish activity-specific baseline data and follow-up.

2. AID Evaluations

In accordance with recommendations of the most recent evaluation as well as other project observations, two evaluations are scheduled for Phase II. The first evaluation is planned for June 1979. ROCAP will contract appropriate professional personnel to carry out this evaluation in coordination with project-associated personnel and agencies throughout the region. In addition to assessing the continued expansion and strengthening of the technology transfer mechanism, this evaluation will specifically examine ICAITI's institutionalization of the activity to insure the best prospects for post-project continuation of the activity as an integral part of ICAITI operations.

The second evaluation will be the final one in March, 1981, as AID support for PTT draws to a close and ICAITI assumes full support responsibility. The proposed financial plan includes \$20,000 for these evaluations.

ROCAP will assist ICAITI in designing the evaluations so that they can contribute to the design and implementation of other technology adaptation and transfer activities under way or proposed in the Central American countries. Included will also be questions on the continued validity of the project design and any necessary changes which may be useful to improve the impact of the project upon the small industrial sector. Special attention will be given to the balance between promotion activities vis-a-vis the provision of services. The establishment of the annual targets in each year's work plan will reflect, as appropriate, the results of this effort.

C. Waivers

This project proposes, as in the past, to finance the local currency costs of the PTT in Central America, with the understanding that ICAITI will increasingly assume these local costs so that by the end of Phase II they will have assumed 100% of such costs. ROCAP has provided such local financing in the past in order to allow ICAITI sufficient time to generate demand for the PTT services, with the expectation that the revenues so generated would make the system self-sustaining. ROCAP has structured this local cost financing on a declining basis. The financial analysis section provides detail on the need for local cost financing and a schedule for increasing ICAITI financing for these costs.

Prior to March 1978, AID policy on grant financing of local procurement was unclear and, therefore, specific waivers were not deemed necessary. Now, however, Handbook 1B limits grant financed procurement to Geographic Code 000. Accordingly, a waiver is now required.

As part of ROCAP's goal to strengthen Central American regional institutions, our intention (and ICAITI's) is to institutionalize the PTT within ICAITI. This requires the recruitment, hiring, and training of qualified Central Americans and supporting their activities in the field. No reasonable alternative is available in that hiring of non-Central American personnel would seriously jeopardize the long-term institutionalization goal of creating a permanent Central American network. ICAITI has been unable to assume the start-up costs of establishing this field network; however, they have increased their home office (Guatemala) support to the increasing technical assistance requirements generated by the PTT. ROCAP has provided these field network costs in the past. For phase II, we propose continuing this funding on a declining basis.

ANNEXES

1. DAEC Approval Cables
2. ICAITI Request for Assistance
3. Project Authorization
4. Consultants' Memorandum
5. Logical Framework
6. Summary Activity Schedule
7. PTT Country Relationships
8. Country Profiles
9. Technology Transfer - Typical Steps
10. Appropriate Technology Activities
11. Technologies Developed/Transferred
12. Examples of PTT Problem Solving
13. Acronyms
14. ICAITI Organizational Chart
15. Status of Central American Government Contribution
16. a. ICAITI Comparative Balance Sheet
b. ICAITI Comparative Income Statements
17. a. ICAITI Activities in Process
b. ICAITI Activities Contracted
18. Actual and Projected Cash Income and
Projected Breakeven Point
19. PTT Activity Recording System

ANNEX 1

DAEC Approval Cables

UNCLAS

STATE 124110

21 May 76 14 04z

VV ESA690BRA860
RR RUESGT
DE RUEHC #4110 1423437
ZNR UUUUU ZZH
R 202046Z MAY 76
FM SECSTATE WASHDC
TO AMEMBASSY GUATEMALA 4351
BT
UNCLAS STATE 124110

ACTION: HECHTMAN
INFO: SIDMAN
RILEY
BOUCHARD

ACTION ~~ROCAP~~
INFO CHARGE
AID
ECON
CHRON

AIDAC

E.O. 11652: N/A

TAGS:

SUBJECT: TRANSFER OF TECHNOLOGY GRANT PP
GUATEMALA FOR ROCAP

1. SUBJECT PROJECT IS HEREBY APPROVED THROUGH PHASE I - AN OPERATIONAL FEASIBILITY STUDY OF APPROXIMATELY 18 MONTHS' DURATION - ONLY. SUBJECT TO THE AVAILABILITY OF FUNDS, FUNDING APPROVAL IS GIVEN FOR UP TO 310,000 DOLLARS. 100,000 DOLLARS IS CURRENTLY PROGRAMMED FOR FY 1976. ROCAP IS AUTHORIZED TO NEGOTIATE A PROJECT AGREEMENT CONSISTENT WITH THIS APPROVAL.

2. ANY FOLLOW ON TO PHASE I AS DESCRIBED IN SUBJECT PP WILL BE IN THE FORM OF YUPROJECT BASED ON A NEW OR REVISED PP WHICH INCORPORATES THE RESULTS OF PHASE I AND WHICH IS REVIEWED AND APPROVED BY THE DAEC. ROBINSON
BT
#4110

MAY 21 10 59 AM '76
FILE ROOM
ROCAP/GUATEMALA

UNCLAS

NNNN

ANNEX 2

ICAITI Request for Assistance

ongoing programs. ICAITI also will be reviewing the administration of the project including consideration of the recent evaluation's recommendation to the effect.

It is also ICAITI's intention to begin to include the direct costs of the transfer network itself in the charges to users. Our goal is to have the system financially self-sufficient by March 31, 1981, i.e. that the system will be operational and wholly dependent upon Central American sources of funding from that date.

In addition, we intend to significantly increase the focus of the system upon the needs of small industries, many of whom are economically and technologically disadvantaged vis-a-vis their medium and larger fellow industries. In this regard, ICAITI views the transfer system as a necessary component in significantly increasing the effectiveness of its expanding activities directed towards rural industries, appropriate technology, and natural resource conservation. We have found that this transfer system has measurably assisted ICAITI in linking its facilities and resources with existing national technical institutions and technical consumers in the region. This has assisted ICAITI in fulfilling its mandate to service the technological requirements of Central America.

ROCAP is requested to provide approximately \$ 909,000 for the 30 month period. ICAITI is prepared to contribute approximately \$ 551,000 for a total cost over the period of \$ 1,460,000.

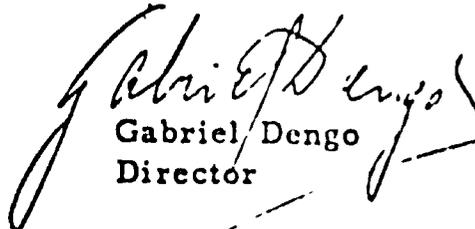
For the Transfer of Technology project, ROCAP support for the 30-month second phase will help support continuation of the contracts for the project coordinator and three field representatives as well as for the addition of two field representatives (to cover the two countries which now have no resident representative) and an administrative assistant to the project coordinator as recommended in the last evaluation. This funding also will permit ICAITI to expand its extra-regional resources for technological information and assistance with institutions such as Denver Research Institute, Georgia Institute of Technology, and CODOT, with which useful ties have been developed so far, and with other appropriate institutions which can help facilitate the technology transfer process.

ICAITI's contribution will cover the estimated local costs of project management, technical assistance coordination, and adminis-

trative support. Beginning in 1980, ICAITI will begin also to assume a share of the direct costs of the transfer system.

I look forward to continued close cooperation in this project effort and to increasing success as we expand out capacities for serving the technological needs of the Central American Region.

Sincerely yours,



Gabriel Dengo
Gabriel Dengo
Director

ANNEX 3

Project Authorization

AGENCY FOR INTERNATIONAL DEVELOPMENT PROJECT AUTHORIZATION AND REQUEST FOR ALLOTMENT OF FUNDS PART I		1. TRANSACTION CODE <input type="checkbox"/> A - ADD <input type="checkbox"/> C - CHANGE <input type="checkbox"/> D - DELETE	PAF 2. DOCUMENT CODE 5
3. COUNTRY/ENTITY ROCAP		4. DOCUMENT REVISION NUMBER 2	
5. PROJECT NUMBER (7 digits) [596-0066]	6. BUREAU/OFFICE A. SYMBOL: LAC B. CODE: [5]	7. PROJECT TITLE (Maximum 40 characters) [Transfer of Technology]	
8. PROJECT APPROVAL DECISION <input type="checkbox"/> A - APPROVED <input type="checkbox"/> D - DISAPPROVED <input type="checkbox"/> DE - DEAUTHORIZED		9. EST. PERIOD OF IMPLEMENTATION YRS. [0] [4] QTRS. [3]	

10. APPROVED BUDGET AID APPROPRIATED FUNDS (\$000)									
A. APPROPRIATION	B. PRIMARY PURPOSE CODE	PRIMARY TECH. CODE		E. 1ST FY 79		H. 2ND FY 80		K. 3RD FY	
		C. GRANT	D. LOAN	F. GRANT	G. LOAN	I. GRANT	J. LOAN	L. GRANT	M. LOAN
(1) EH	750B	977		250		510			
(2)									
(3)									
(4)									
TOTALS									

A. APPROPRIATION	N. 4TH FY		O. 5TH FY		LIFE OF PROJECT		11. PROJECT FUNDING AUTHORIZED		A. GRANT	B. LOAN
	C. GRANT	P. LOAN	R. GRANT	S. LOAN	T. GRANT	U. LOAN	ENTER APPROPRIATE CODE(S): 1 = LIFE OF PROJECT 2 = INCREMENTAL LIFE OF PROJECT	C. PROJECT FUNDING AUTHORIZED THRU		
(1)									2	
(2)										
(3)										
(4)										
TOTALS										
									FY [3] [0]	

12. INITIAL PROJECT FUNDING ALLOTMENT REQUESTED (\$000)			13. FUNDS RESERVED FOR ALLOTMENT		
A. APPROPRIATION	B. ALLOTMENT REQUEST NO. 5		TYPED NAME (C/N/L, S/R/I/E/M/F/S/D) SIGNATURE DATE		
	C. GRANT	D. LOAN			
(1) EH	250				
(2)					
(3)					
TOTALS		250			

14. SOURCE/ORIGIN OF GOODS AND SERVICES: 000 981 LOCAL OTHER See Part II

15. FOR AMENDMENTS, NATURE OF CHANGE PROPOSED

This amendment:

a) Increases total A.I.D. project funding from \$493,000 to \$1,253,000; and

b) extends the life of the project to March 31, 1981.

FOR PPC/PIAS USE ONLY	16. AUTHORIZING OFFICE SYMBOL	17. ACTION DATE			18. ACTION REFERENCE (Optional)	ACTION REFERENCE DATE		
		MM	DD	YY		MM	DD	YY

PROJECT AUTHORIZATION AND REQUEST FOR ALLOTMENT OF FUNDS

PART II

NAME OF ENTITY:

Central American Regional

Central American Research
Institute for Industry

NAME OF PROJECT: Transfer
of Technology

NUMBER OF PROJECT: 596-0066

Pursuant to Part I, Chapter 1, Section 103 of the Foreign Assistance Act of 1961, as amended, I hereby authorize an additional Grant to the Central American Research Institute for Industry (ICAITI) of not to exceed two hundred fifty thousand United States Dollars (\$250,000) to help in financing certain foreign exchange and local currency costs of goods and services required for the project as described hereinafter. The project consists of the establishment of a technology transfer mechanism with the capacity to initiate and sustain the transfer of technical information and applied technologies from regional and extra-regional sources to end user firms in Central America. Grant funding in the amount of Four Hundred Ninety-three Thousand United States Dollars (\$493,000) has already been provided to this Project.

I approve the total level of additional A.I.D. appropriated funding planned for this Project of not to exceed Seven Hundred Sixty Thousand United States Dollars (\$760,000), including the funding authorized above, during the period FY 1979 through FY 1980. I approve further increments during that period of Grant funding up to \$510,000, subject to the availability of funds in accordance with A.I.D. allotment procedures.

I hereby authorize the initiation of negotiation and execution of the Project Agreement by the officer to whom such authority has been delegated in accordance with A.I.D. regulations and Delegations of Authority, subject to the following essential terms and covenants and major conditions, together with such other terms and conditions as A.I.D. may deem appropriate.

I. Source and Origin of Goods and Services

Goods and services, except for ocean shipping, financed by A.I.D. under the Project shall have their source and origin in the Central American Common Market or in the United States, except as A.I.D. may otherwise agree in writing. Ocean shipping financed under the Grant shall be procured in the United States.

II. Covenants

A. Except as A.I.D. shall otherwise agree in writing, ICAITI shall covenant and agree to: (1) provide such goods and services as may be agreed upon between A.I.D. and ICAITI for a total value of not less than

the equivalent of Five Hundred and Fifty-one Thousand United States Dollars (\$551,000), including the services of a Project director, during the period October 1, 1978, through December 31, 1981; and (2) develop annual work plans, satisfactory in form and substance to A.I.D., for the field agents which shall address, inter alia, the special activities to be directed at small industries during the year. This will include the establishment of targets and quotas for small industry participation in services provided by ICAITI under this project.

Clearances A.
B.
C.
D.
E.
F.

Signature

Assistant Administrator
Bureau for Latin America and the
Caribbean

Date

ANNEX 4

Consultants' Memorandum



INSTITUTO CENTROAMERICANO DE
INVESTIGACION Y TECNOLOGIA INDUSTRIAL
ICAITI

ANNEX 4

APR 7 3 26 PM '78

CENTRAL AMERICAN RESEARCH INSTITUTE FOR INDUSTRY
Avenida La Reforma 4-47, Zona 10
GUATEMALA, C. A

FILE ROOM
ROCAP/GUATEMALA

April 7th, 1978

APARTADO POSTAL 1552
Telex: 312-ICAITI-GU
TELEFONOS 60631/5
Cables: ICAITI

COSTA RICA
EL SALVADOR
GUATEMALA
HONDURAS
NICARAGUA

Ref.

ACTION Hektman
INFO Venezia

Mr. Harry Ackeman
Director
ROCAP
c/o United States Embassy
GUATEMALA CITY

Dear Mr. Ackerman:

The undersigned team has spent the period April 3 to 7 reviewing the phase I PTT Program of ICAITI and, in conjunction with Elias Hill and ICAITI staff members, planning an effective Phase II for the project. As a result of this intensive review and planning effort, the following general observations are presented for your consideration:

- 1) It is the considered team belief that the PTT project is presently functioning in a most satisfactory manner in full filling the original project goal and purpose. It is obvious that in carrying out the recommendation of the second evaluation (employment of a sales-engineer) that a significant management control function has been added to the system. The individual, Mr. E. Hill, while employed as a contract employee by ICAITI, as functioning as a project manager and coordinator. Largely due to his efforts, effective reporting procedures have been developed, communications have been improved, and a better record keeping system implemented. The field representatives, as they gained experience, are performing more effectively than earlier in the program. Internally at ICAITI, the establishment of the PTT committee, which includes the directors of all divisions, has promoted project coordination and provided a greater integration of the project into the ICAITI organization. The monthly meetings of the field representatives now provide opportunities for activity discussion and problem resolution, better coordination, and a more complete understanding of ICAITI's capabilities on the part of the field reps.

....!

2) The team viewed with great concern the apparent belief that the Technical Extension Service is expected ultimately to be self-supporting. The team members, with a relatively broad knowledge of agricultural and industrial extension systems throughout the world, are unaware of any comparable system which is entirely self-supporting. Existing extension services which were considered include the following:

U. S. Cooperative Extension Service (Dept. of Agriculture Support)

18 Industrial extension systems at U.S. educational institutions (Dept. of Commerce Support).

Industrial extension system established at the University of the Philippines (AID Support).

Industrial extension system established at the University of Ife (Nigeria) (AID Support).

Fisheries cooperative extension service (National Marine Fisheries Service Support).

Industrial extension system established by Institute of Technology Bandung, Indonesia (Netherlands Government Support).

Small business centers at U.S. educational institutions, (SBA support)

These extension systems are all heavily subsidized by public and private sector units.

The concern of the team was somewhat reduced when a study of the logical framework of the project paper revealed at the end of Phase II it was anticipated that 30% of the costs would be covered by user payments. This seemed to the team to be a reasonable assumption. However, in view of the possibility that some reviewers might have the impression that the total project should be self-supporting we wish to emphasize that this 30% figure is an ultimate goal.

3) In Phase I several organizational and procedural difficulties were encountered in establishing this new project and activity at ICAITI. It would have been unrealistic to expect otherwise. All such extension systems of which the team is aware have had initial difficulties of a similar kind as those encountered by ICAITI. Further, other such systems undergo a continual process of evolution, procedural refinement, and realignment to suit changing conditions, and the same dynamic modification of the technical extension service should be expected with the passage of time.

4) The principle of recovery of indirect costs by contractors is well recognized within the Agency for International Development, and U.S. contractors to AID usually recover such indirect costs. The PTT contract does not provide for indirect costs recovery by ICAITI problems, yet ICAITI contributes significantly to the project through use of its facilities, library, equipment, personnel, experience and contacts throughout the world. The existence of the PTT therefore contributes to the budgeting difficulties of ICAITI.

The equity of imposing on a developing region institution the waiver of indirect costs is a debatable point. When a project is small relative to the total volume of a contractor's business, it does not impose serious problems normally. However, the PTT project represents about 25% of ICAITI's contract income and the waiver of indirect costs on the project by ICAITI is a significant item. In the end it causes ICAITI to raise its indirect cost charges on other projects for other sponsors to make ends meet thus making ICAITI less competitive in the market place.

The team recognized that this condition has been accepted by ICAITI for Phase and II of the PTT Project. However, it recommends that any future contracts between ROCAP and ICAITI permit the full or partial recovery of indirect costs.

5) While we are uncertain of the feasibility of doing so, we recommend a slight change in the written goal of the Program, to encompass the idea of light capital technology.

The project goal as shown in the project paper is as follows:

GOAL: The goal of the project is to accelerate the flow of know-how from industrialized countries, particularly from the U.S., to Central America. The principal beneficiaries would be small and medium-scale industrial enterprises; to a limited extent, public sector institutions and larger enterprises would also benefit.

The recommended goal statement is as follows:

GOAL: To develop a mechanism to accelerate the flow of know-how from industrialized countries, especially the U.S., to developing countries, in this case Central America. The principal beneficiaries would be small and medium enterprises particularly those which are not capital intensive. To a limited extent, public sector institutions and larger enterprises would also benefit.

6) In the experimental Phase I the holding of three evaluations in an 18 month period seemed appropriate. However such evaluations are costly and time consuming and it is recommended that consideration be given to hold in just two evaluations during the operational Phase II.

We appreciate the opportunity to present these comments and recommendations to you.

Sincerely yours,

James P. Blackledge
James P. Blackledge

Clinton O. Chichester
Clinton O. Chichester

Ross W. Hammond
Ross W. Hammond

ACTION COPY	
THIS COPY MUST BE RETURNED TO THE FILE INDICATING THE ACTION TAKEN AND DATE	
ACTION TAKEN <i>noted</i>	
DATE	INITIALS
<i>April 11, 1978</i>	<i>RW</i>

ANNEX 5

Logical Framework

PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK

Life of Project:
From FY 1979 to FY 1981
Total U. S. Funding 909,000
Date Prepared: Oct. 10, 1978 (revision # 1)

Project Title & Number: Transfer of technology (596-0066)

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS																											
<p>Program or Sector Goal: The broader objective to which this project contributes:</p> <p>To improve the technology transfer process to industries in Central America, emphasizing small and medium-scale enterprises.</p>	<p>Measures of Goal Achievement:</p> <ol style="list-style-type: none"> 1. More rural and urban technological needs are being identified and satisfied than before. 2. Extra-regional technologies are being introduced more quickly and effectively for small and medium-scale industries. 3. End users have greater accessibility to available technologies. 	<ol style="list-style-type: none"> 1. Survey of national and regional technological institutes to compare trends of technological service deliveries. 2. Assessment by knowledgeable observers of technology introduction. 3. Survey of end users. 	<p>Assumptions for achieving goal targets:</p> <ol style="list-style-type: none"> 1. There exists a need for proposed services. 2. ICAITI can coordinate roles and inputs of intra- and extra-regional technology sources. 																											
<p>Project Purpose:</p> <p>To establish a technology transfer mechanism (Program of Technology Transfer - PTT) that has the capacity to initiate and sustain idea, information and technology exchange between Central America and foreign "sources" and Central American "users" (firms).</p>	<p>Conditions that will indicate purpose has been achieved: End of project status.</p> <ol style="list-style-type: none"> 1. PTT fully funded from C.A. sources 2. ICAITI and national transfer activities increased significantly (at least 20%) above previous levels. 3. Small Industry has greater access to Technology. 	<ol style="list-style-type: none"> 1. National private and public sector endorsement and funding of ICAITI's project activities. 2. Review of ICAITI and national technology institutes' transfer records. 3. Annual random sample evaluations 	<p>Assumptions for achieving purpose:</p> <ol style="list-style-type: none"> 1. National legislation/regulation will not impede transfer process 2. User-appropriate technology can be located and adapted by ICAITI to needs of Central America. 																											
<p>Outputs:</p> <ul style="list-style-type: none"> 1. Transfer Mechanism Established and financially self-sufficient. 2. Staff Effectiveness Improved 3. Transfer Activity Increased 4. Small Industry Activity Increased 	<p>Magnitude of Outputs:</p> <ol style="list-style-type: none"> 1. 5 trained Field Representatives and full-time coordinator on direct hire to ICAITI. 2. 60 client contacts per month; assistance provided to 30 clients p/m. 3. Ten small industry seminars per year for 200 participants. 4. 50% of all contacts and diagnostic of small businesses accomplished. 	<ol style="list-style-type: none"> 1. Annual work plans. 2. Inspection of ICAITI's rolls. 3. Inspection of records, interviews with representatives. 4. Review of field representatives' contact reports. 5. Review of ICAITI budgets. 	<p>Assumptions for achieving outputs:</p> <ol style="list-style-type: none"> 1. ICAITI will have the resources to support institutionalization of the activity. 2. Activity momentum can be sustained at feasibility-established level 																											
<p>Inputs:</p> <ul style="list-style-type: none"> 1. Technical Assistance <ul style="list-style-type: none"> a. US (37.5 P/M) b. Local (156 P/M) 2. Contract Services 3. Training 4. Other Costs 5. Contingency/Inflation 	<p>Implementation Target (Type and Quantity)</p> <table border="1"> <thead> <tr> <th></th> <th>ICAITI (\$000)</th> <th>ROCAP</th> </tr> </thead> <tbody> <tr> <td>1.</td> <td></td> <td></td> </tr> <tr> <td></td> <td>a. -</td> <td>118</td> </tr> <tr> <td></td> <td>b. 148</td> <td>198</td> </tr> <tr> <td>2.</td> <td>89</td> <td>145</td> </tr> <tr> <td>3.</td> <td>22</td> <td>25</td> </tr> <tr> <td>4.</td> <td>242</td> <td>346</td> </tr> <tr> <td>5.</td> <td>50</td> <td>83</td> </tr> <tr> <td></td> <td><u>551</u></td> <td><u>909</u></td> </tr> </tbody> </table>		ICAITI (\$000)	ROCAP	1.				a. -	118		b. 148	198	2.	89	145	3.	22	25	4.	242	346	5.	50	83		<u>551</u>	<u>909</u>	<p>Review of ROCAP and ICAITI project records (monthly reports, contracts, invoices, etc.).</p>	<p>Assumptions for providing inputs:</p> <p>AID and ICAITI funds as programmed will be forthcoming.</p>
	ICAITI (\$000)	ROCAP																												
1.																														
	a. -	118																												
	b. 148	198																												
2.	89	145																												
3.	22	25																												
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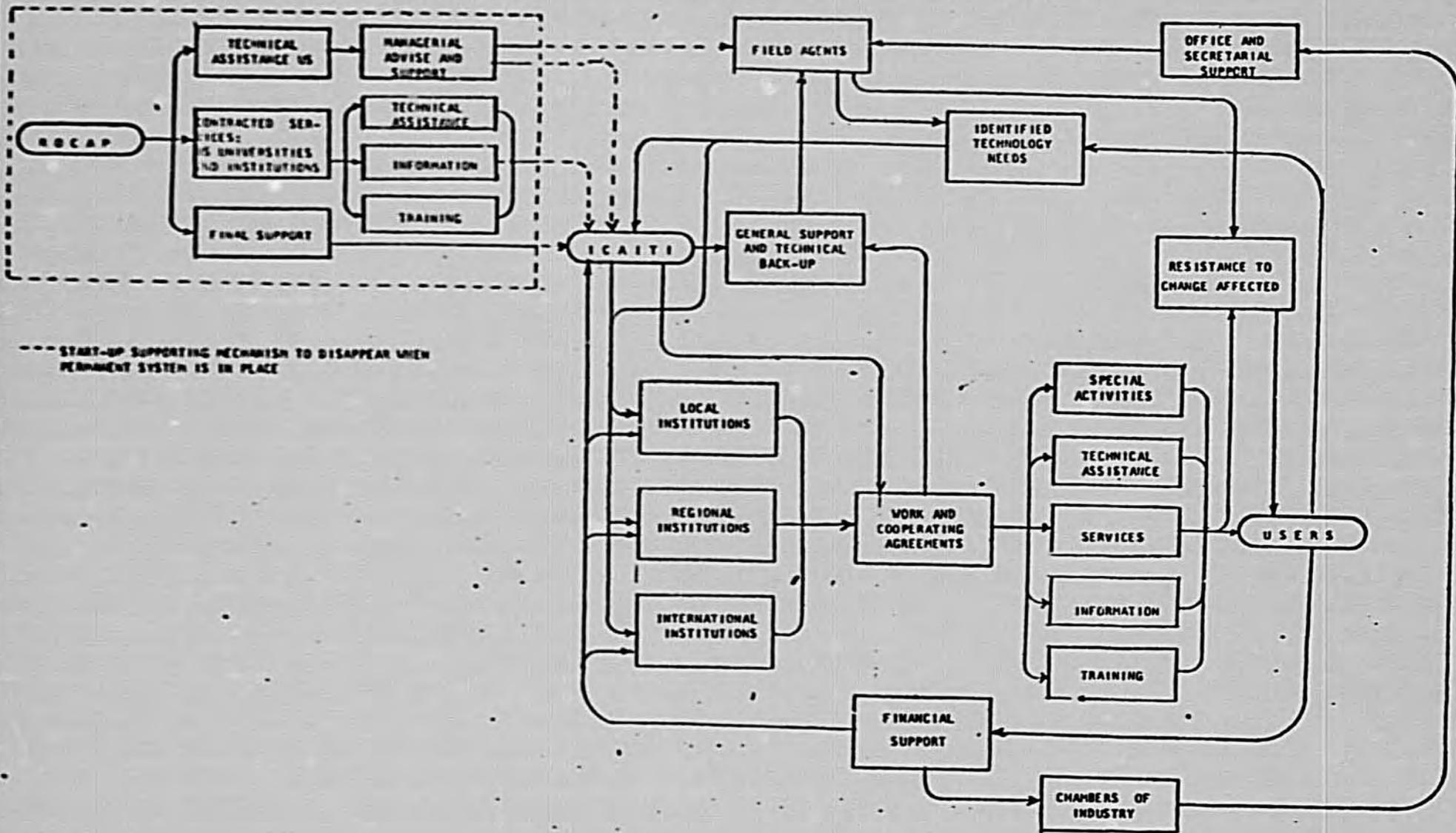
ANNEX 6

Summary Activity Schedule

ANNEX 7

PTT Country Relationships

TECHNOLOGY TRANSFER SYSTEM



RELACIONES INSTITUCIONALES DEL PTT POR PAIS

<u>INSTITUCION</u>	<u>FUNCION PRINCIPAL</u>	<u>TIPO DE RELACION</u>
<u>GUATEMALA</u>		
- Cámara de Industria de Guatemala	Organización Industrial privada	Contraparte PTT
- Instituto Técnico de Capacitación y Productividad (INTECAP)	Institución descentralizada del gobierno con patrimonio propio y financiamiento parcial de la empresa privada	Cooperación mútua
- Consejo Nacional de Planificación económica (CNPE)	Organización gubernamental de planificación económica	Orientación áreas de acción nacio
- Corporación Financiera Nacional (CORFINA)	Institución financiera de fomento Industrial	Cooperación mútua
- Universidad de San Carlos, Facultad de Ingeniería	Estudios superiores de Ingeniería	Cooperación mútua
- Banco de Guatemala, Departamento de Investigaciones Agrícolas e Ind.	Banco central cuyo departamento se encarga de estudios económicos sectoriales	Cooperación mútua
- Banco Nacional de la Vivienda (BANVI) División de pequeña empresa	Financiamiento, prom. y construcción de vivienda popular. Asistencia crediticia a pequeñas empresas, especialmente de materiales de const.	Cooperación mútua
Ministerio de Economía	Organismo ejecutor de las políticas económicas	Organo de enlace con ICAITI
Comisión Guatemalteca de Normas (COGUANOR)	Emisión de normas y control de calidad	Cooperación mútua

<u>INSTITUCION</u>	<u>FUNCION PRINCIPAL</u>	<u>TIPO DE RELACION</u>
Centro Mesoamericano de estudios sobre tecnología apropiada, (CEMAT)	Organización privada que promueve investigación tecnológica apropiada	Cooperación mútua
Secretaría de Integración Económica Centroamericana (SIECA)	Organismo coordinador de las políticas de integración económica	Cooperación mútua
Instituto Nutricional de Centroamérica y Panamá (INCAP)	Organismo regional de investigación nutricional	Cooperación mútua
Oficina Panamericana de la Salud (OPS)	Organismo regional de la salud	Cooperación mútua
<u>ORGANISMOS INTERNACIONALES</u>		
Denver Research Institute	Instituto de investigaciones de la Universidad de Denver	Asesoría al PTT y Cooperación mútua
Georgia Tech.	Instituto de Tecnología de Georgia	Asesoría al PTT y cooperación mútua
Consortio para el Desarrollo Tecnológico (CODOT)	Organización compuesta por las universidades de California, en Davis, Washington, en Seattle, Wisconsin, Michigan state and Rhode Island. Programa de tecnología de alimentos	Asesoría al PTT y cooperación mútua
National Technical Information Service (NTIS)	Servicio de Información Técnica	El PTT es usuario de este servicio
Comité Intergubernamental para las migraciones europeas (CIME)	Organismo internacional con sede central en Ginebra, Suiza, tiene un programa de recursos humanos para el desarrollo de C. A. y Panamá	Cooperación mútua

<u>INSTITUCION</u>	<u>FUNCION PRINCIPAL</u>	<u>TIPO DE RELACION</u>
- International Executive Service Corps (IESC)	Sociedad internacional no lucrativa formada por hombres de empresa con el propósito de perfeccionar los negocios de mundo	Cooperación mútua
<u>EL SALVADOR</u>		
- Asociación Salvadoreña de Industriales	Organización Industrial privada	Contraparte y sede local del PTT
- Centro Nacional de Productividad (CENAP)	Institución gubernamental de adiestramiento, inf. y asistencia técnica a la industria	Cooperación mútua
- Comité de exportadores de El Salvador (COEXPORT)	Institución encargada de la promoción de las exportaciones	Cooperación mútua
- Fondo de Inversiones y de garantía de la pequeña empresa (FIGAPE)	Programa de financiamiento y apoyo a la pequeña empresa	Cooperación mútua
- Instituto Salvadoreño de Fomento Industrial (INSAFI)	Institución financiera de Fomento Industrial	Cooperación mútua
- Organismo Internacional Regional de Sanidad Agropecuaria (OIRSA)	Organismo de control agropecuario	Cooperación mútua
- Ministerio de Planificación y Coordinación Económica (CONAPLAN)	Planificación Económica	Cooperación mútua
- Ministerio de Economía	Organismo ejecutor de políticas económicas	Organo de enlace con el ICAITI

<u>INSTITUCION</u>	<u>FUNCION PRINCIPAL</u>	<u>TIPO DE RELACION</u>
<u>HONDURAS</u>		
- Asociación Nacional de Industriales de Honduras (ANDI)	Organización industrial privada	Contraparte y sede PTT
- Centro de Información Industrial del Banco Central (CIIBANTRAL)	Servicio de Información técnica al empresario industrial	Colaboración mútua en Informació
- Corporación Nacional de Inversiones (CONADI)	Entidad financiera de fomento industrial	Cooperación mútua
- Consejo Superior de Planificación Económica (CONSUPLANE) Unidad de Ciencias y Tecnología y Sección Industrial	Planificación Económica, ciencia y tecnología	Cooperación mútua
- Ministerio de Economía	Organismo ejecutor de políticas económicas	Organo de enlace con el ICAITI
- Dirección General de Industrias	Coordinación de políticas industriales, registro de propiedad industrial y control de calidad	Cooperación mútua
- Centro Cooperativo Técnico Industrial (CCTI)	Institución de desarrollo de la pequeña industria	Cooperación mútua
- Cámara de Comercio e Industrias de Cortés	Organización privada de comerciantes e industriales	Contraparte PTT
- Instituto de Formación Profesional (INFOP)	Instituto de enseñanza y capacitación de nivel primario	Cooperación mútua
- Banco Centroamericano de Integración Económica (BCIE)	Banco de desarrollo regional	Cooperación mútua

<u>INSTITUCION</u>	<u>FUNCION PRINCIPAL</u>	<u>TIPO DE RELACION</u>
<u>NICARAGUA</u>		
- Cámara de Industrias de Nicaragua (CADIN)	Organización industrial privada	Contraparte y sede local del PTT
- Departamento de Investigaciones Tecnológicas del Banco Central	Laboratorios de Investigación de tecnología de alimentos	Cooperación mútua
- Exporteros	Centro de Promoción de exportaciones	Cooperación mútua
- Ministerio de Economía	Organismo ejecutor de las políticas económicas	Organo de enlace con el ICAITI
- Instituto de Fomento Nacional (INFONAC)	Institución financiera de fomento Industrial	Usuario del PTT, cooperación mútua
<u>COSTA RICA</u>		
- Cámara de Industrias de Costa Rica	Organización industrial privada	Contraparte y sede local del PTT
- Universidad de Costa Rica	Centro de Investigación de Tecnología de alimentos	Cooperación mútua
- Instituto Tecnológico de Costa Rica	Instituto tecnológico y centro de información y asistencia técnica	Cooperación mútua
- Consejo Nacional de Investigaciones Científicas y Tecnológicas (CONICIT)	Promueve las investigaciones científicas y tecnológicas en el país	Cooperación mútua
- Oficina de vivienda Industrial (OVI)	Organización de asesoría a trabajadores industriales para la solución de problemas de vivienda	Cooperación mútua

<u>INSTITUCION</u>	<u>FUNCION PRINCIPAL</u>	<u>TIPO DE RELACION</u>
- Corporación Costarricense de Desarrollo (CODESA)	Entidad financiera y de fomento Industrial	Cooperación mútua
- Ministerio de Economía	Organismo ejecutor de las políticas económicas	Organo de enlace con el ICAITI
- Confederación Universitaria Centroamericana (CSUCA)	Formada por las universidades nacionales de Centroamérica	Cooperación mútua
- Instituto Centroamericano de Administración Pública (ICAP)	Organismo regional de estudios superiores de Administración Pública y asuntos de Integración	Cooperación mútua

ANNEX 8

Country Profiles

COUNTRY PROFILES

1. El Salvador

General

The major part of technical assistance in El Salvador has been in the areas of food and textiles. The former has involved technical assistance or information on products such as mayonnaise, cashew nuts, vegetable oils, salt, seafood, milk products, etc. Presently, work is progressing on a process of producing milk from coconuts. A study on the technology requirements of small industry is underway. A seminar for approximately 20 GOES entities will be held in November as a first step in creating an in-country transfer of technology system. The Mayor of San Salvador has requested assistance in the industrial use of wastes, installation of modern slaughterhouses, and in wholesale markets. The PTT field agent is Jaime González (Engineer-Food Specialist) and is located at the Asociación Salvadoreña de Industriales (ASI).

Contacts and Services

The field agent has contacted approximately 240 industrialists out of which 73 services have been provided in the following areas: 26 information, 25 technical assistance and 12 services.

Close working relation with the following institutions:

(a) Asociación Salvadoreña de Industriales (ASI)

This is a private organization formed by most of the industrialists of the country. This institution provides office space and secretarial support to the field agent and plays an important role for PTT. PTT uses ASI to organize meetings, conferences and other activities to properly identify technology needs among industrialists. PTT news is in the local papers very frequently, due largely to support from this association.

(b) Productivity Center (CENAP)

This productivity center has become one of the most important elements in El Salvador for PTT to develop and test approaches for canvassing with industrialists and technological

sources. PTT has conducted seminars, conferences, work groups, etc. PTT is a close advisor to CENAP offering PTT experiences to guide their activities.

(c) Comité de Exportadores de El Salvador (COEXPORT)

Private organization oriented to the promotion of exports. They are located in the same offices with ASI. This committee is a link to PTT in finding technology needs and in disseminating technologies. Presently PTT is carrying out a survey of technology needs among exporters through this entity.

(d) Fondo de Inversiones y de Garantía de la Pequeña Empresa (FIGAPE)

Government financial institution dedicated to the development of the small industry. PTT has become an advisor to them in several aspects in relation to the small industry. FIGAPE utilizes ICAITI's services to provide technical assistance to their priority industries.

(e) Instituto Salvadoreño de Fomento Industrial (INSAFI)

Government financing institution for industrial development. PTT and this institutions have worked on sectorial programs (textiles and metal-mechanic). ICAITI through PTT was able to provide a German technician on textiles.

2. Costa Rica

Costa Rica is involved in establishing its own in-country expertise in many technological areas. The University of Costa Rica will soon undergo a major expansion in the sciences under an IDB loan, and the Cartago Technological Institute is also scheduled for a major expansion financed by IDB. PTT activities in Costa Rica have been largely promotional to date, with services provided largely on a no-fee basis to attract business. The field agent (Félix del Barco - Chemical Engineer) is located at the Chamber of Industry. As Costa Rican expertise in technology adoption increases, the PTT will provide a valuable link between this effort and ICAITI and other activities in the area.

Contacts and Services

The field agent has contacted approximately 258 industrialists out of which 77 services have been provided in the following areas: 48 information, 7 technical assistance and 22 services.

Close working relations with the following institutions:

(a) Chamber of Industry of Costa Rica

Private institution where all industrial sectors are represented. PTT field representative has his office there and receives secretarial support. The field agent is invited to all sectorial meetings and, consequently, he is well informed as to industrialists' problems and needs. This institution is a model as far as working relationships are concerned.

(b) Centro de Investigación en Tecnología de Alimentos (CITA)

A food investigation center of the Costa Rican University. Several joint action activities have been conducted with this institution. Costa Rica is presently interested in better quality controls for food products. Several activities undertaken by PTT and CITA include conferences, seminars, training, etc.

(c) Technical Institute of Costa Rica

This is a technical institution and information center. This institute is moving into a more active role in providing industrial and technical assistance. PTT is coordinating with their activities in small industry.

(d) Consejo Nacional de Investigaciones Científicas y Tecnológicas (CONICIT)

This is an official group created to promote scientific and technological investigations. PTT has become an important factor to them. Technology needs and transfer of alternative solutions are being discussed.

(e) Corporación Costarricense de Desarrollo (CODESA)

Financial institution for industrial development. PTT has conducted conferences with this corporation to focus on certain problems of general benefit for the industrial community.

(f) Comité Intergubernamental para las Migraciones Europeas (CIME)

Agency dedicated to the search and contracting of manpower available in Europe for long-term requirements. This has been a source of know-how to provide follow-up on technologies that require long-term technical supervision.

3. Guatemala

General

Guatemala is the site of ICAITI and therefore provides a wide range of activities to local industrialists. This has not, as might be expected, made PTT that much more effective. One problem is that the field agent (Carlos González - Industrial Engineer) is located at ICAITI rather than the Chamber of Industry. This has proven to be a limiting factor, and the recent evaluation recommended that he be moved. This is expected shortly. PTT has generated, however, a wide range of activities including services for a synthetic indigo blue manufacturing process, a market study on dehydrated soups, analysis of marble, industrial diagnostics in textiles and food, a paper plant reorganization plan, etc.

Contacts and Services

The field agent has contacted approximately 143 industrialists from which 57 services have been provided in the following areas: 23 information, 16 technical assistance, and 18 services

Close working relation with the following institutions:

(a) Chamber of Industry of Guatemala

Link to reach industrialists at all levels. Using their facilities, PTT conducts seminars, conferences, round table discussions, etc. They have a bimonthly magazine where they advertise PTT activities.

(b) Secretaría del Consejo Nacional de Planificación Económica

Link that helps to establish priorities and development programs within the government. Their section of industry and mining has worked with PTT in analyzing industrial sector priorities.

(c) San Carlos University (Engineering Faculty)

PTT is helping students at the University in developing eight feasibility studies for new techniques in the manufacturing of construction materials.

(d) Instituto Técnico de Capacitación y Productividad (INTECAP)

This is a decentralized government productivity center. PTT has worked on joint programs specially designed to help small industry. They have found PTT a strong link to private enterprise. INTECAP is also the site for SIATE in Guatemala. This information link is used by the field agent to provide local information assistance.

(e) National Finance Corporation (CORFINA)

This is a government financing organization oriented to develop industry, mining and tourism in Guatemala. PTT, through ICAITI's Industrial Services Division provides technical assistance to them and to private industries that utilize their loans. PTT promotes their financing capability to fulfill specific needs in implementing technologies.

(f) Mesoamerican Center for Appropriate Technology Studies (CEMAT)

This is a private institution dedicated to promote technologies for low income people. PTT has provided assistance to them in areas where the facilities of ICAITI can assist them. Presently we are studying possibilities for a closer relation with joint projects.

4. Nicaragua

General

The field agent from San Salvador services Nicaragua on a one week per month basis. This has been found to be detrimental to both San Salvador and Nicaragua PTT activities.

Contacts and Services

The field agent has contacted approximately 30 industrialists out of which 11 services have been provided in the following areas: 8 information, 2 technical assistance and 1 service.

Close working relations with the following institutions:

(a) Nicaraguan Chamber of Industry (CADIN)

This institution provides office space and secretarial support to field agent. The chamber is quite interested in PTT

activities, but unfortunately the unsettled political situation has frustrated several actions. Another factor that has contributed in a negative way to the program is that the field agent only spends part time in Nicaragua as his residence is in San Salvador.

(b) Central Bank

This bank has three departments that cooperate and develop programs in close relation with PTT:

1) Laboratory for food investigation

A food investigation laboratory set up under direct collaboration and technical assistance from ICAITI. Several joint programs have been developed to satisfy technological needs.

2) Exportemos

An export oriented department based at the Chamber of Industry. PTT with them have organized special assistance programs to help small industries with potential to export their products.

3) Departamento de Investigaciones Tecnológicas (DIT)

A department to provide technical assistance and information to industry. This department has participated directly in the various programs carried out with "Exportemos". This section also is ICAITI's counterpart within the information mechanism in Nicaragua. A program has been designed with DIT to help small industry. As soon as the field agent for that country is hired this action will be started.

(c) Instituto de Fomento Nacional (INFONAC)

Government financial institution oriented to the industrial development of the country. PTT has close relations with them as they constantly seek PTT to advise on different technological matters.

5. Honduras

General

This is another case where only part time services have been provided. Services are provided by the Guatemalan PTT field agent.

Contacts and Services

The field agent has contacted approximately 90 industrialists out of which 54 services have been provided in the following areas: 32 information, 13 technical assistance and 9 services.

Close working relations with the following institutions:

(a) Asociación Nacional de Industriales de Honduras (ANDI)

This is the chamber of industry with members from all areas and parts of the country. This institution is providing office space and secretarial support to the field agent. Since the field agent also covers Guatemala, place of his residence, he only spends one week per month in Honduras. ANDI attempts to fill the gap when the field agent is not present. This is a very useful link with industrialists from all parts of the country. PTT is presently searching for a full time local field representative.

(b) Dirección General de Industrias

This is a government organism where industrial development policies are developed and/or coordinated. All industries must register with them. This organism is also responsible for quality norms and controls of the country. This institution is a PTT link that has proven very useful in the location of needs and the dissemination of technologies at a government level.

(c) Central Bank

This is a government institution where the SIATE is located. This is the local information link to PTT.

(d) Central American Bank for Economic Integration (CABEI)

PTT in conjunction with CABEI have organized and conducted several meetings with industrialists with the idea of joining efforts in regional needed technologies, e.g. alcohol for fuel, paper technology, and general approaches in industrial development.

(e) Chamber of Commerce and Industry of Cortés

Institution in San Pedro Sula, same as ANDI. They also have offered full support to PTT and are willing to provide office space and secretarial support to the program. This possibility was considered, but due to the fact that most Government Agencies are in Tegucigalpa, ANDI was considered more convenient; nevertheless, when the field representative visits that region he operates from their office. This chamber is a very useful contact with the industrial community of that region.

ANNEX 9.

Technology Transfer - Typical Steps

Technology Transfer-Typical Steps

ACTION	ACTION REQUIRED	ACTION TAKEN BY
Technology users willing to cooperate	Promotional activities	Field Agent, ICAITI, local and regional institutions
Technology need identified	Visits, conferences, round table discussions, seminars, workshops, industrial and sectorial diagnosis, etc.	Field Agent, ICAITI, local and regional institutions
Technology need described	Analysis and write-up of need	Field Agent, user, ICAITI, and regional institutions
Technology source selected	Analysis of possible source to fulfill need	Field Agent and ICAITI
Technology need transferred to technical source	Letters, telephone calls, etc. to selected source	Field Agent and ICAITI
Alternative technologies identified	Search for alternative possibilities	ICAITI, local, regional and international institutions
Alternative selected	Comparative analysis of alternative made	Field Agent, ICAITI, and user
Ways and conditions for implementation established	Analysis of user's specific conditions	User, ICAITI, local, regional and international institutions
Proposal prepared and submitted to user	Analysis of required work and cost of same	Field Agent, ICAITI, local, regional, and international institutions
Conditions accepted by technology user	User's decision	User
Arrangements made with technology user to conduct implementation	Job programming and scheduling	User, ICAITI, local, regional and international institutions
Technique implemented	Specific activities to insure implementation of technique	User, selected organization or organizations, to perform the task
Follow-up	Contacts	Field Agent

ANNEX 10

Appropriate Technology Activities

Examples of ICAITI project activities related to appropriate technology

1. Study on consequences of pesticides use in Central American cotton production

This study on environmental and economic effects of pesticides use was carried out 1974-76 under a grant from the U.N. Environmental Program, with some assistance from the U.S. National Academy of Sciences (AID-funded).

2. Improvement of energy-efficiency in the production of lime

Disastrous deforestation can be noted in the areas of Guatemala in which lime is burned on a commercial scale, particularly in the Cabrican region. ICAITI has participated in research to develop more efficient kilns.

3. Conversion of agricultural wastes to organic fertilizer through micro-organic action

ICAITI has participated in research to convert cellulose agricultural wastes, mixed with dung, into valuable fertilizer, with methane gas as a by-product. A number of small plants are currently in operation on individual farms in Guatemala.

4. Pyrolytic conversion of agricultural wastes

Pilot operations are already established in Ghana and Indonesia. The process involves small-scale controlled combustion of agricultural wastes (cotton stalks, rice and coffee hulls, coconut husk fiber, bagasse, etc.) to produce char, oil and gas. This is an old, but nearly forgotten technology. CORFINA, a Guatemalan development finance institution, has contracted ICAITI to undertake a feasibility study prior to installing several units in Guatemala.

5. Reduction of gossypol content in cottonseed meal

Cottonseed contains a toxic pigment called gossypol. ICAITI developed and patented a process which reduces the gossypol content to acceptable limits for the use of the cottonseed meal as animal feed. This process has

the advantage that it can be incorporated into the existing cottonseed processing operations in Central America without making them obsolete. A pilot plant is in operation at ICAITI and the first cottonseed processor is presently negotiating for the commercial utilization of this technology.

6. Local manufacture, installation and servicing of hand pumps

Jointly with Georgia Tech., ICAITI is assisting in the local manufacture in Central America and installation in remote villages of a sturdy type of pump which was designed by Batelle Memorial Institute under an AID contract. This implementation program, sponsored by AID, presently only covers Nicaragua and Costa Rica.

7. Use of cane sugar alcohol as partial substitute for petroleum

ICAITI has presented a plan to the Ministers of Economy of Central America for the establishment of alcohol production plants using cane sugar as raw material. Under this plan, an additional 53,000 "manzanas" would be cultivated to produce cane, giving employment to nearly 25,000 additional workers. In addition to its use in combination with gasoline as motor fuel, the alcohol could be used in the production of ethylene, polyethylene and chloro-vinyl.

8. Solar Energy

ICAITI is starting some research on solar dryers, particularly for the drying of grains and other agricultural output.

9. Identification of investment opportunities in rural areas

ICAITI has been contracted by the Guatemalan Planning Office to identify productive activities in the rural areas of three Departments of the Republic. The aim is to identify resources and the means of developing these through the use of labor intensive, low capital investments.

10. IDB Grant for development of appropriate technology

ICAITI recently received a grant from the IDB to evaluate nine ideas of appropriate technology and to develop pilot units of the four most promising of these.

11. Technical assistance to artisan fishermen in Central America

ICAITI has submitted a proposal to undertake a technological assistance program to the artisan fishermen in Central America. The program has the double purpose of:

- Reintroducing old technologies for preserving fish, such as through smoking, salting and drying.
- Providing a cheap source of protein to the rural population.

12. Identification of agroindustrial opportunities in rural areas

ICAITI has submitted a proposal to undertake a project for the identification of agroindustrial investment opportunities in rural areas which, through the use of appropriate technology, could be implemented by cooperatives.

13. Small agricultural implements production and use promotion in Central America

ICAITI has had preliminary discussions to handle for Central America the promotional effort for local manufacture of agricultural implements developed or improved by the International Rice Institute in the Philippines. This effort is to be advanced in cooperation with Georgia Tech.

ANNEX 11

Technologies Developed/Transferred

ANNEX 11

EXAMPLES OF TECHNOLOGIES
DEVELOPED AND/OR TRANSFERRED BY ICAITI^{1/}

<u>Reference</u>	<u>Description</u>
3005	Low capacity dehydrator for bananas (10 kg/day) (S) ^{2/} Development and construction of a unit and sulfur chamber for drying bananas. Objective: Aid small producers.
3008	Cream manufacturing process - using egg whites (G) Development of a recipe to prepare herbal creams from eggs.
3010	INCAPARINA - Low-cost high protein content food for human consumption (R) Comparative analysis to other high protein content foods.
3018	Hydrochloric acid - cooking vat (R) Converting a traditional cooking vat into a new process based on electric energy.
5024	Sheller for cashew nuts (N) (S) Development of hand tools to open and extract the cashew nuts to be utilized by small producers.
1133	New mechanical extractor process for lime oil (G) (CR)
7030	Process for manufacturing tomato paste and soups (N)
3037	Lemon grass and citronella panels - simplified process (G) (CR) Technique to utilize wastes after the oil is extracted, to manufacture construction panels.

^{1/} This list covers the three-year period 1975-1977 and thus predates in part the PTT project.

^{2/} Key: Salvador (S), Guatemala (G), Nicaragua (N), Costa Rica (CR), Honduras (H), and Regional (R).

- 7042 **Breakfast cereal containing milk (R)**
Development of a market extension product which requires only water, prior to consumption.
- 7048 **Process for "cardamomo" oil seed extraction (G) (CR)**
Analysis of different forms of drying cardamomo in relation to its yield capability and best process for extracting oil.
- 1176 **Process for fresh coconut oil extraction (S)**
A new method for extracting coconut oil was developed for a pilot plant. A formal plant was designed and constructed for the Dominican Republic, but never went into operation, as approximately 50 percent of its parts were stolen during the last revolution.
- 1192 **Special packaging process for ground coffee (R)**
ICAITI holds a patent on this process which is properly registered in the United States.
- 1195 **Waste lime bagasse utilization (G) (CR)**
- 1201 **Manufacturing process for cassava starch and glue (S)**
A starch manufacturer contracted ICAITI to develop a better process for them to utilize in their operations.
- 1207 **Process for utilizing green bananas as animal food (CR)**
A group of farmers contracted ICAITI to develop ways of utilizing banana for feeding pigs.
- 1233 **Kiln dryer for bricks - improved firewood consumption (G)**
Remodeling of kiln to better utilize fuels.
- 1243 **New industrial uses for molasses (R)**
Citric acid manufacturing system was improved. This improvement was never used, as citric acid producers in the world is a very close group, which holds patents on prices system and allows no one to interfere with their operations.
- 1272 **Development of a high nourishing value drink (R)**
- 1274 **Process for producing activated carbon from agricultural waste (R)**

- 1295 Process details for evaporating and freezing eight tropical fruits (R)
- 1297 Pulp and paper - development of process for non-traditional raw materials (R)
- 1309 Process for extracting vanilla (R)
- Evaluating the quality of vanilla and market acceptance by brokers in the United States, depending on the specific process utilized for extracting it.
- 1322 Process for utilizing coffee and sugar wastes (R)
- Coffee and sugar wastes utilized in the production of fungicides for animal food production.
- 1339 Development of a micro-biological process for the production of cheeses (S)
- Development and test of various fungicides for cheese production to provide the traditional Swiss taste.
- Process for the production of vinegar from fruit wastes
- 1340 Uses for coffee wastes (R)
- 1343 Technology for processing hides (tanning) (R)
- 1348 Technology for paper making from sugarcane bagasse (R)
- Evaluation of available technologies and possibilities of applying same in Central America.
- 1350 Technique for storing grains (R)
- 1352 Technique for manufacturing veneer (G) (CR)
- 1358 Technique for non-traditional uses of local available raw materials - enzymes (R)
- 1359 Development of techniques for utilizing leather waste in the production of reclaimed leather (G)
- 1371 Technique for canning marañon (wasted in the cashew nut harvesting) (R)
- 1375 Technique to process and can products for USA export, including processing, storage, and packaging (R)
- 1384 R & D techniques to produce micro-biological protein from slaughter house wastes (mycolial fungicide) (R)

- 1385 Develop technique to dehydrate exotic fruits (R)
Dehydration of tropical fruits to maintain the flavor and aroma.
- 1393 Technology to properly protect cross ties (treating and preserving) (N)
- 1438 Methods for manufacturing oils for the tanning industry (R)
- 1454 Technology for the production of fuel from sugarcane (R)
Utilization of sugar in the production of alcohol to be utilized as fuel.
- 1493 Evaluation of several techniques for the production of potato flour and adaptation of one to serve the producer contracted with ICAITI (N)
- 1536 Development of uses for aluminum scrap (G)
- 1538 Development of a process to manufacture synthetic indigo blue from anti-anilico acids (G)
- 1545 Drying techniques for cashew nuts (N) (S)
- 1554 Cotton seed flour with low content of "gossypol" (R)
ICAITI holds a patent on this process and has sold it on a limited basis to one Central American country only. ICAITI expects to sell this process in other parts of the world.
- 1570 Process to produce a coconut drink (S)
A recipe to produce at industrial level this drink and coconut shell used as a container for rum.
- 1571 Development of a high efficiency lime kiln with low fuel consumption (G)
- 1579 Technique in preserving tropical fruits (R)
- 1580 Aerobic fermentation of coffee pulp (BID appropriate technology project) (R)
- 1585 Fuel production from agricultural wastes (BID appropriate technology project) (R)
- 1586 Solar dryer for grains (BID appropriate technology project) (R)

- 1587 Utilization of coffee pulp (waste) for animal food (BID appropriate technology project) (R) ✓
- 1588 Low-cost water filters for human consumption (BID appropriate technology project) (R) ✓
- 1589 Mini-plant for cement production (BID appropriate technology project) (R) ✓
- 1590 Construction of brick and roofs from agricultural wastes (BID appropriate technology project) (R) ✓
- 1591 Calcium carbide production for rural small industrial processes (BID appropriate technology project) (R) ✓
- 1606 R & D uses of solar energy for drying small crops (H) ✓
DRI project in Honduras to aid the small farmers.

ANNEX 12

Examples of PTT Problem Solving

EXAMPLES OF PTT PROBLEM SOLVING

The following are some specific examples in the small scale or rural industry area where improved technology has been transferred following an initial contact by PTT. These examples are suggestive of the ways in which PTT helps ICAITI meet the needs of small industry.

- Mathias y Cia., S.A.

The problem was high breakage of cashew kernels and waste by hand shelling. PTT investigated and found an improved way of reducing breakage by 45% and waste by 15%. Although this particular product was aimed for export, cashew processing in many areas of Central America is a cottage industry, and the technology developed is of general use.

- Small Quantity Brick Kiln

PTT recognized the fact that the large kiln operators were cutting down too many trees in some areas. The Forest Services began to restrict the quantity of wood available for firing the kilns. At PTT's instigation, ICAITI developed a small kiln to permit decentralization to the more rural areas, thereby spreading the impact of wood usage over larger areas.

- Sangreta, S.A.

This company could not get into operation because its product was spoiling in the bottle before it was sold. The PTT Field Representative in Costa Rica solved the problem without outside assistance and the company is now in operation.

- Industrias Metálicas, S.A.

The problem of this company was the disposal or utilization of broken glass and scraps. PTT found and suggested three alternative uses. These solutions can be applied by others with the same problem.

- Empresa Cocotera Son-Millet

Previously this firm had been burning coconut husks

to dispose of them. Through investigation by PTT it was suggested that the fibers could be woven into matting for which a European market existed. Such a use for coconut husks can provide added income in rural areas.

- Aceitera La Corona, S.A.

PTT was contacted because the peanuts for human consumption had a very short shelf life. Through technical information available at ICAITI, the problem was solved by applying an anti-oxidizing agent.

ANNEX 13

Acronyms

ACRONYMS USED IN THIS PAPER

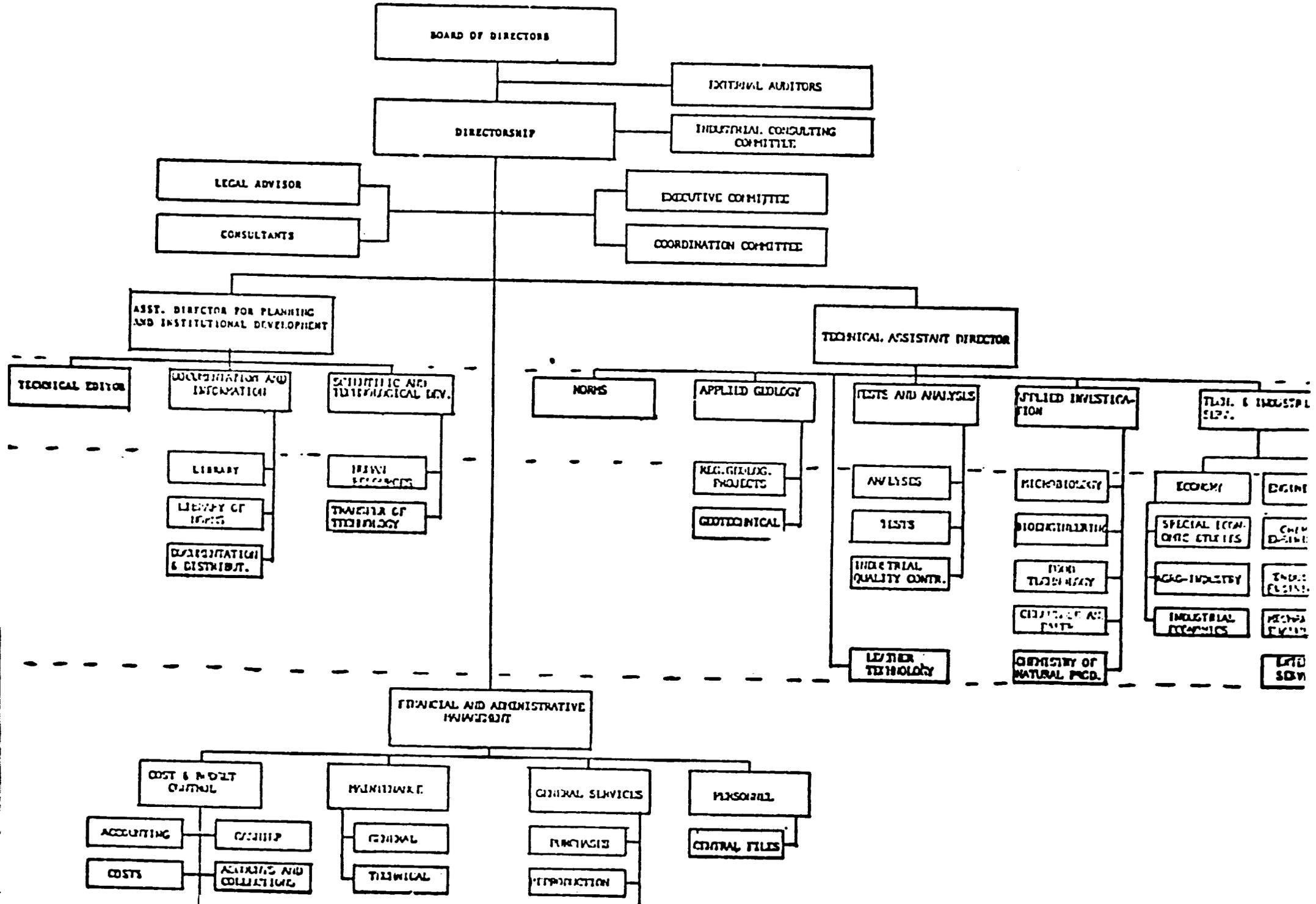
CABEI	Central American Bank for Economic Integration
CATIE	Center for Tropical Agricultural Research and Training
CODOT	Consortium for the Development of Technology
DRI	Denver Research Institute
GIT	Georgia Institute of Technology
ICAITI	Central American Research Institute for Industry
ICI	Intermediate Credit Institution
IICA	InterAmerican Institute for Agricultural Sciences
IRRI-PAK	International Rice Research Institute - Pakistan
ITDG	International Technology Development Group
LCT	Light Capital Technology
OAS	Organization of American States
PIADIC	Central American Agricultural Information Program
PTT	Program for the Transfer of Technology
UNIDO	United Nations Industrial Development Organization

ANNEX 14

ICAITI Organizational Chart

ORGANIZATIONAL CHART

Annex 14



ANNEX 15

Status of Central American Government
Contributions

Status of Central American Government Contributions

Table I - Status of Central American Government Contributions reflects \$478,500 as the amount due to ICAITI at 7/31/78. Of the \$478,500 outstanding \$253,500 corresponds to 1978 quotas and \$225,000 to quotas prior to 1978. Subsidies have been at an annual rate of \$75,000/country since 1976 with the exception of Guatemala which pledged \$80,000 plus an extraordinary quota of \$20,000 a year. Prior to 1976, subsidies were established at \$52,000/country/year with the exception of Guatemala which provided \$80,000/year beginning in 1971.

At July 31, 1978 the status of outstanding quotas by country was as follows:

1. Costa Rica - \$66,000:

This amount pertains to the balance owed on the 1978 quota and since Costa Rica makes its payments on a quarterly basis no problem is foreseen.

2. El Salvador - \$75,000:

ICAITI has contacted the Ministry of Finance of El Salvador and expects to receive payment in November of this year. The amount relates to the 1978 quota.

3. Honduras - \$60,500:

The amount outstanding corresponds to one-half of the 1978 quota (\$37,500) and an increment from 1975 to 1976 quotas (\$23,000). ICAITI has contacted the Ministry of Economy and expects to receive payment on the 1978 balance in November of this year and the balance in the first quarter of 1979.

4. Nicaragua - \$277,000:

Amount outstanding pertains to the following yearly quotas:

<u>Year</u>	<u>Amount (US \$000)</u>
1975	\$ 52
1976	75
1977	75
1978	<u>75</u>
Total	\$ 277

Upon request of the GON, ICAITI confirmed the outstanding quotas on July 28, 1978 for inclusion in the Nicaraguan National Budget. ICAITI expects to receive \$75,000 by November 1978 and the balance next year. Due to ICAITI's cash flow problems in 1977, caused in part to the non-payment by Nicaragua of its yearly contributions, ICAITI obtained an 18-month loan from CABEI on November 8, 1977 in the amount of \$202,000. The loan expiration date is May 7, 1979 and bears interest at 6%. The Nicaraguan outstanding quotas for 1975, 1976 and 1977 were pledged as collateral for this loan.

TABLE I**I C A I T I****STATUS OF CENTRAL AMERICAN GOVERNMENTS CONTRIBUTION**

<u>Country</u>	<u>Outstanding Balance 12-31-77</u>	<u>1978 Quotas</u>	<u>Payments Received</u>	<u>Outstanding Balance</u>		<u>Date of Last Payment</u>
				<u>1/ Amount</u>	<u>Period</u>	
Costa Rica	\$ 34,250	\$ 75,000	\$ 43,250	\$ 66,000	1978	May 78
El Salvador	---	75,000	---	75,000	1978	---
Guatemala	---	100,000 <u>2/</u>	100,000 <u>2/</u>	---	---	March 78
Honduras	46,000	75,000	60,500	60,500	1976 & 1978	April 78
Nicaragua	<u>254,000</u>	<u>75,000</u>	<u>52,000</u>	<u>277,000</u>	1975 thru 1978	July 78
TOTAL	\$ <u>334,250</u>	\$ <u>400,000</u>	\$ <u>255,750</u>	\$ <u>478,500</u>		

1/ At 7/31/782/ Includes \$20,000 extraordinary contribution

ANNEX 16

- a. ICAITI Comparative Balance Sheet**
- b. ICAITI Comparative Income Statements**

I C A I T I
 CONDENSED COMPARATIVE BALANCE SHEET (AUDITED)
 As of December 31, 1975 through 1977
 (US \$000)

<u>ASSETS</u>	As of					
	<u>12/31/75</u>		<u>12/31/76</u>		<u>12/31/77</u>	
<u>Current Assets</u>						
Cash in Bank	\$220		\$214		\$ 267	
Accounts Receivable						
CA Governments	325		339		334	
Accts. Receivable Other	213		126		103	
Projects in Process	553		251		459	
Inventory	104		104		92	
Other	43	\$1,458	50	\$1,084	48	\$1,303
Employee Benefit Fund	--			436 ^{1/}		515 ^{1/}
<u>Fixed Assets (Net)</u>		<u>678</u>		<u>647</u>		<u>622</u>
Total Assets		<u>\$2,136</u>		<u>\$2,167</u>		<u>\$2,440</u>
<u>LIABILITIES AND EQUITY</u>						
<u>Current Liabilities</u>						
Accounts Payable	\$ 17		\$ 40		\$ 61	
Accumulated Leave	63	\$ 80	55	\$ 95	60	\$ 121
Long Term Loans Payable	--		--			202
<u>Employee Benefit Fund</u>	--		--	504		630
<u>Deferred Credits</u>						
Loans Payable	\$ 66		\$ 50		\$ 12	
Project Advances	512	578	108	158	225	237
<u>Equity</u>						
Paid in Capital	\$ 923		\$1,071		\$ 916	
C.A. Government Quotas	325		339		334	
General Reserve	230	1,478	--	1,410	--	1,250
Total Liabilities and Equity		<u>\$2,136</u>		<u>\$2,167</u>		<u>\$2,440</u>

^{1/} This account represents the fully funded portion of the Employee Benefit fund as reflected in the liability section (above), this fund totaled \$503,496 in 1976 and \$629,947 in 1977.

COMPARATIVE INCOME STATEMENTS (AUDITED)
For the Years Ending December 31, 1975 Through 1977
(U.S. \$000)

	<u>Fiscal Years Ended</u>		
	<u>12/31/75</u>	<u>12/31/76</u>	<u>12/31/77</u>
<u>INCOME</u>			
Government Contributions	\$ 208	\$ 366	\$ 385
Contracts, Projects and Programs	1,139	940	411
Donations and Subsidies	28	42	25
Other	<u>108</u>	<u>315</u>	<u>55</u>
TOTAL INCOME	<u>\$1,483</u>	<u>\$1,663</u>	<u>\$ 876</u>
<u>EXPENSES</u>			
Cost of Contracts, Projects and Programs	\$1,443	\$1,333	\$ 868
Own Activities	73	51	73
Other	<u>--</u>	<u>131</u>	<u>100</u>
TOTAL EXPENSES	<u>\$1,476</u>	<u>\$1,515</u>	<u>\$1,031</u>
NET INCOME (LOSS)	<u>\$ 7</u>	<u>\$ 148</u>	<u>\$ (155)</u>

ANNEX 17

- a. ICAITI Activities in Process (1977)**
- b. ICAITI Activities Contracted (1978)**

ICAITI

ACTIVITIES IN PROCESS AT DECEMBER 31, 1977

<u>Project</u>	<u>Contractual Cost</u>	<u>Sponsor Sector</u>
Estudio para determinar las bases y lineamiento política científica y tecnológica	\$ 8,500	Public
Estudios tecnológicos sectoriales	27,500	Int'l Org.
Programa Nacional sobre transferencia de tecnología en Guatemala	10,000	"
Ciclos secado y procedimientos preservación maderas centroamericanas	123,140	"
Adaptación proceso elaboración harina de papa	1,440	Private
Asistencia técnica en microbiología	3,770	Public
Conservación y procesamiento frutas tropicales	26,500	"
Producción alcohol etílico y proteína microbiana de melazas	14,000	"
Asistencia técnica general a empresa	3,850	Private
Investigación sobre el tratamiento de aguas de lavado de café	5,600	"
Concesión licencia para uso patente gosipol	5,000	"
Almacenamiento de frutas tropicales bajo atmósferas modificadas	2,961	Int'l Org.
Asistencia técnica en geología y minería	57,125	Public
Servicios geológicos Proyecto Pueblo Viejo	24,000	Private
Asistencia técnica en procedimientos administrativos	9,595	Public
Proyecto Transferencia de Tecnología (PTT)	152,000	Int'l Org.
Desarrollo de Proyectos Industriales	15,350	Public

ICAITI
ACTIVITIES IN PROCESS AT DECEMBER 31, 1977

<u>Project</u>	<u>Contractual Cost</u>	<u>Sponsor Sector</u>
Evaluación resitencia y eficiencia bomba manual	\$24,000	Int't Org.
Proyectos factibilidad higuerrillo, frutas glase- adas, fabricación ruedas abrasivas, bisagras y otros herrajes, grifería y llaves de paso	75,517	Public
Proyectos factibilidad briquetas carbón de leña, puertas y marcos de madera, parquet maderas duras y ladrillo tubular	57,200	Public
Disponibilidad calidad materias prima para cal hidratada	7,500	Private
Instalación planta refinar sal	31,000	Private
Asistencia textil	6,000	Private
Fermentación aeróbica pulpa cafe	4,969	Int'l Org.
Investigación de materias primas, procesos productivos y otros aspectos de varias empresas	2,500	Private
Determinación capacidad instalada	1,050	"
Industrialización productos alimenticios	37,000	Int'l Org.
Industrialización maderas tropicales	26,600	"
Centro de Información Industrial	15,000	"
Análisis y pruebas varias practicadas en productos y otras muestras	15,600	Private
Asistencia técnica empresa muebles	6,000	"
Evaluación yacimientos de grava	400	"
Asistencia técnica textil	<u>20,000</u>	Public
Total	\$820,667 *****	

ICAITI

ACTIVITIES CONTRACTED DURING THE PERIOD
January 1, 1978 through June 21, 1978

<u>Project</u>	<u>Contractual Cost</u>	<u>Sponsor Sector</u>
Producción combustibles a partir de desechos agrícolas	\$ 15,800	Int'l Org.
Utilización de secadores solares para preservación de granos	9,905	"
Aprovechamiento pulpa de café para forraje y/o abono químico	13,790	"
Purificación de agua para consumo humano, utilizando pequeños filtros	12,556	"
Miniplanta de cemento de horno vertical	5,097	"
Ladrillos, techos y otros elementos de construcción en base de desperdicios vegetales	10,794	"
Producción de carburo de calcio para uso en pequeños talleres del área rural	4,658	"
Miniplanta de pasta celulósica en base de desperdicios agrícolas	9,900	"
Segunda Fase de los Proyectos Anteriores	577,500	"
Programa de capacitación servicios de información a la industria (II)	4,050	Private
Asesoría en normalización, control de calidad y metrología	8,626	Int's Org.
Evaluación de yacimientos de mármol	400	Private
Adiestramiento y capacitación personal	680	"
Estudio mercado varios productos	48,000	"
Curso sobre principios de control de procesos términos y evaluación cierres de envases	4,500	"

ICAITI
 ACTIVITIES CONTRACTED DURING THE PERIOD
 January 1, 1978 through June 21, 1978

<u>Project</u>	<u>Contractual Cost</u>	<u>Sponsor Sector</u>
Seminario sobre uso y manejo plaguicidas	\$ 2,300	Private
Asistencia en Ingeniería Mecánica	30,720	Public
Reparación de emergencia planta	1,000	Private
Programa de capacitación, clasificación, almacenamiento y recuperación de información	1,500	"
Asistencia en el sistema regional de laboratorios aduaneros	8,000	Int'l Org.
Capacitación análisis microbiológicos	600	Private
Utilización energía solar para secado cosechas	10,500	Private
Seminario para Directores de Institutos Latino- americanos de Investigación Tecnológica	17,500	"
Servicios de consultoría en sistemas de informa- ción financiera y procedimientos administrativos	75,000	Public
Capacitación análisis microbiológicos	400	Private
Seminario sobre preparación y promoción proyectos de pequeña empresa	<u>2,000</u>	Public
	<u>\$875,776</u> *****	

ANNEX 18

**Actual and Projected Cash Income
and Projected Breakeven Point**

Actual and Projected Cash Income and Projected Breakeven Point

Section IV.E (Financial Analysis) provides an analysis of ICAITI's financial status based upon audited financial statements. This annex provides information regarding actual and projected cash income based upon information provided by ICAITI's accounting department.

Attached Table I shows actual sources of ICAITI's funding for the past four years. Actual income for the period 74-77 shows a decrease from \$1.5 million in 1974 to \$973,000 in 1977. This reduction is mostly attributable to the reduction in projects with the Public Sector and with Regional and International Organizations. Revenue from these contracts declined from \$353,300 in 1974 to \$152,200 in 1977 for the Public Sector and from \$607,000 in 1974 to \$218,200 in 1977 for the Regional and International Organizations. Eventhough there has been a decrease in cash income during the past four years (1974-1977), the trend appears to have improved during the first seven months of 1978 with revenues of \$696,936 being generated. ICAITI projects revenues of \$1,230,000 for 1978. Actual cash receipt at July 30, 1978 and projections through December 31, 1978 follow:

<u>Source</u>	1978		<u>Total</u>
	<u>As of July</u>	<u>Projected thru Dec.</u>	
Government contributions	\$ 256	\$ 188	\$ 444
Contracts, projects and programs			
Public Sector	114	55	169
Private Sector	142	65	207
Regional and International Organizations	174	216	390
Other	<u>11</u>	<u>9</u>	<u>20</u>
Total	\$ 697	\$ 533	\$1,230

ICAITI operating without the PTT, reaches breakeven with sales of 1,080,000 (see attached Tables II and III). By adding ICAITI's share of PTT fixed expenses (\$79,200) to total fixed expenses, the breakeven point changes to US\$1,224,000. In other words, the breakeven point increases by US\$144,000. This figure appears high, but in reality is low in relation to the benefits that ICAITI obtains from the program. Some of these benefits are:

- ICAITI with PTT is expected to increase its sales by at least US\$420,000 per year.
- ICAITI, with PTT, has a considerable higher potential to reach breakeven than without it.
- PTT gives ICAITI the opportunity (through its field agents) to properly establish a foothold in each of the five Central American countries; comply with the mandates from the C.A. Governments, etc.

ICAITI ACTUAL INCOME YEARS 1974 - 1977
(US\$000)

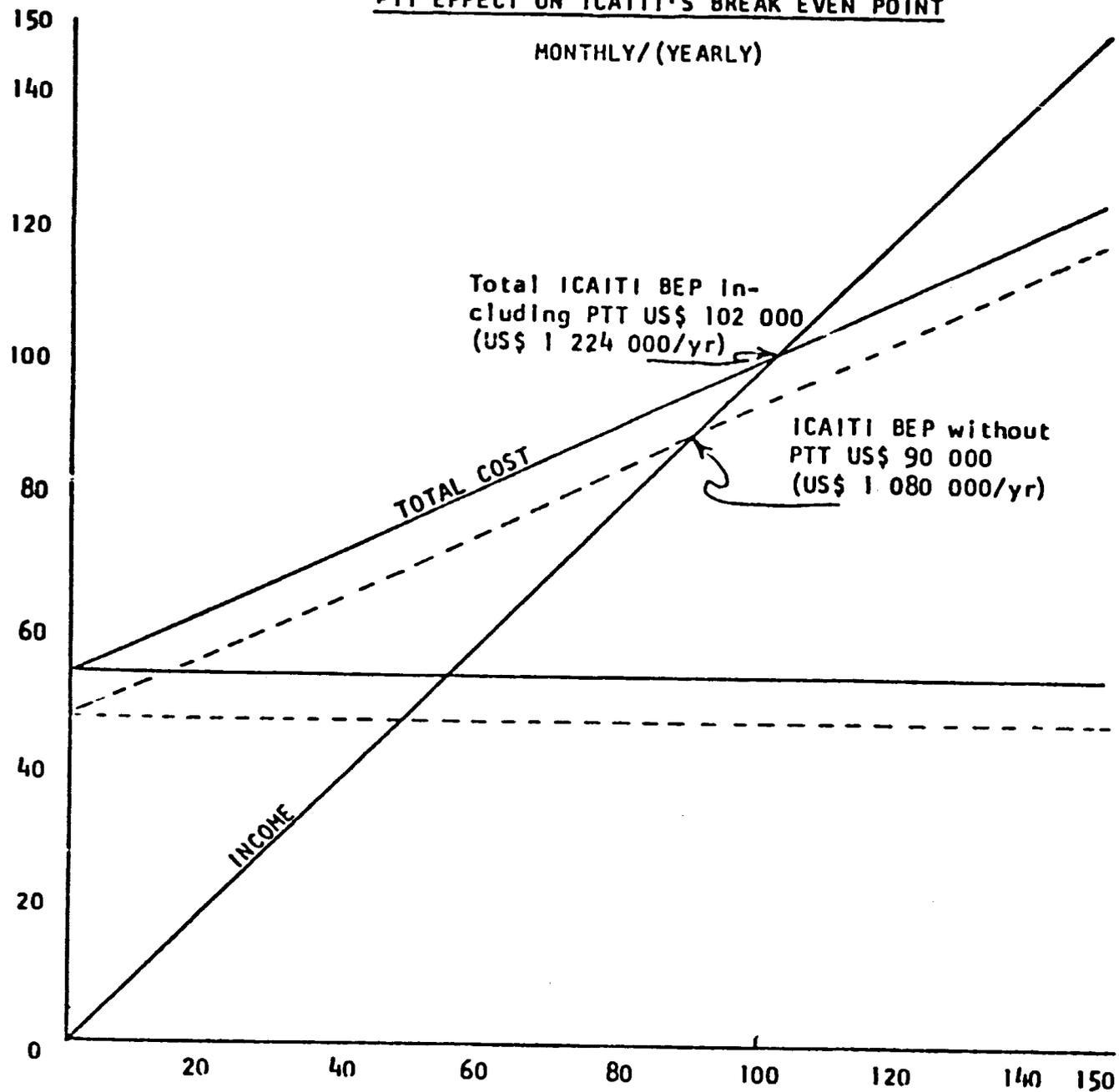
	1974	1975	1976	1977
I. CONTRIBUTIONS-CENTRAL AMERICAN GOVERNMENTS	\$ 289,0	\$236,0	\$386,0	\$404,7
1. Costa Rica	52.0	52.0	52.0	76.7
2. El Salvador	78.0	52.0	130.0	176.0
3. Guatemala	80.0	80.0	100.0	100.0
4. Honduras	79.0	52.0	52.0	52.0
5. Nicaragua	--	--	52.0	--
II. CONTRACT SERVICES, PROGRAMS AND OTHER WORK	\$1,078,0	\$889,6	\$619,3	\$510,1
1. Public Sector	<u>353,3</u>	<u>233,8</u>	<u>86,5</u>	<u>152,2</u>
a. Governments	<u>6,2</u>	<u>15,7</u>	<u>17,0</u>	<u>14,7</u>
(1) Nicaragua	3.2	9.4	--	0.8
(2) Guatemala	3.0	5.8	2.1	1.5
(3) El Salvador	--	0.5	14.9	11.3
(4) Honduras	--	--	--	0.2
(5) Panama	--	--	--	0.9
b. Autonomous Entities	<u>\$ 347,1</u>	<u>\$218,1</u>	<u>\$ 69,5</u>	<u>\$137,5</u>
(1) INSAFI, El Salvador	0.1	--	--	1.9
(2) CNPE, Guatemala	30.5	58.0	9.2	--
(3) INDE, Guatemala	--	--	3.9	10.0
(4) Banco Central, Rep. Dom.	146.0	146.5	31.7	--
(5) IGSS, Guatemala	0.3	0.1	0.2	0.1
(6) Xayá-Pixcayá, Guatemala	6.8	2.0	--	--
(7) IDAI, Haití	99.0	10.2	--	--
(8) CORFINA, Guatemala	0.6	--	--	--
(9) Bank of Guatemala	12.1	--	5.0	9.8
(10) Municipality of Guatemala	0.3	0.2	--	--
(11) INDECA, Guatemala	51.4	--	--	--
(12) Central Bank of Nicaragua	--	1.1	1.7	--
(13) BANDESA, Guatemala	--	--	1.1	1.1
(14) INFONAC, Nicaragua	--	--	14.7	61.8
(15) INTECAP, Guatemala	--	--	0.6	0.3
(16) INVU, Costa Rica	--	--	1.4	--
(17) I.P.M., Guatemala	--	--	--	26.2
(18) Hospital Roosevelt, Guatemala	--	--	--	0.8
(19) INDOTEC, Dominican Republic	--	--	--	24.7
(20) CENAP, El Salvador	--	--	--	0.6
(21) National Bank of Honduras	--	--	--	0.2

TABLE I
Page 2 of 2

	1974	1975	1976	1977
2. Private Sector	<u>\$117.7</u>	<u>\$151.3</u>	<u>\$ 99.1</u>	<u>\$139.7</u>
(1) Costa Rica	1.7	0.9	--	2.0
(2) El Salvador	32.1	7.9	29.7	30.6
(3) Guatemala	56.7	96.7	59.1	79.4
(4) Honduras	0.1	4.8	0.4	0.3
(5) Nicaragua	1.8	0.4	1.2	--
(6) Other Countries Outside the Area	25.3	40.6	8.7	27.4
3. Organizations	<u>\$607.0</u>	<u>\$504.5</u>	<u>\$433.7</u>	<u>\$218.2</u>
a. International	<u>\$421.2</u>	<u>\$286.6</u>	<u>\$136.0</u>	<u>\$115.8</u>
(1) IDB	1.5	--	--	--
(2) OAS	93.3	101.8	89.8	67.7
(3) AID	117.9	45.9	2.8	--
(4) United Nations	16.2	--	--	33.6
(5) UNIDO	0.3	--	--	--
(6) UNESCO	--	5.5	5.0	7.5
(7) WAITRO	--	--	--	--
(8) UNEP	188.5	119.0	33.5	--
(9) IDRC, Canada	3.5	0.6	--	--
(10) CEPAL	--	13.8	--	--
(11) UNCTAD	--	--	4.9	--
(12) FAO	--	--	--	7.0
b. Regional	<u>\$185.8</u>	<u>\$217.9</u>	<u>\$297.7</u>	<u>\$102.4</u>
(1) PROMECA	3.3	4.8	--	--
(2) ROCAP	180.4	190.8	262.4	70.9
(3) CABEI	2.1	22.0	22.5	7.5
(4) SIECA	--	0.3	12.8	23.5
(5) IICA	--	--	--	0.5
III. OTHER INCOME	<u>\$ 99.0</u>	<u>\$ 86.6</u>	<u>\$101.3</u>	<u>\$ 57.9</u>
1. Interest	41.5	52.1	48.3	16.9
2. Miscellaneous	12.4	6.7	10.8	15.7
3. Grants and Subsidies	45.1	27.8	42.2	25.3
GRAND TOTAL	<u>\$1,466.0</u>	<u>\$1,212.2</u>	<u>\$1,106.6</u>	<u>\$972.7</u>

PTT EFFECT ON ICAITI'S BREAK EVEN POINT

MONTHLY/(YEARLY)



- 1) BEP increased US\$ 12 000 (US\$ 144 000/yr)
- 2) Contribution of \$ Income to fixed expenses remains at US\$ 0.5353
- 3) Potential to increase income is highly increased

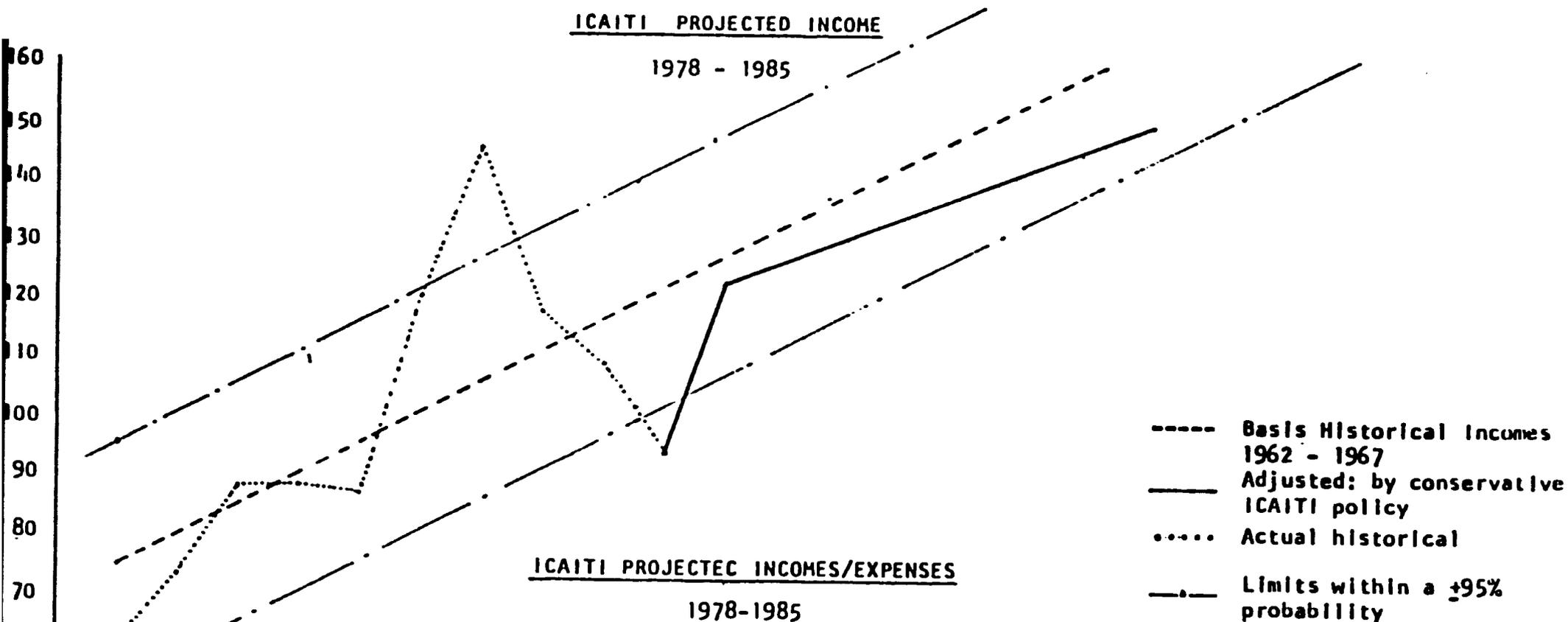
PTT fixed expenses US\$ 6 600 (US\$ 79 200/yr)

ICAITI fixed expenses without PTT US\$ 48 000 (US\$ 576 000/yr)

Total ICAITI fixed expenses including PTT US\$ 54 600 (US\$ 655 200/yr)

COST IN THOUSANDS OF DOLLARS

INCOME IN THOUSANDS OF DOLLARS



<u>YR</u>	<u>INCOME</u>	<u>EXPENSES</u>	<u>DIFF.</u>
78	1 230.	1 226.8	3.2
79	1 260	1 240.7	19.3
80	1 300	1 259.3	40.7
81	1 340	1 277.9	62.1
82	1 380	1 296.5	83.5
83	1 430	1 319.7	110.3
84	1 460	1 333.7	126.3
85	1 500	1 352.2	147.8

- IN THOUSANDS OF DOLLARS -

ANNEX 19

PTT Activity Recording System

Significado de las abreviaturas de la hoja de resumen de contactos del PTT

<u>Abreviaturas</u>	<u>Significado</u>
R	Representante
C	Cliente
TE	Teléfono
E	Escrita
P	Personal
PR	Promoción
SG	Seguimiento
TR	Trabajo
PQ	Pequeña
MD	Mediana
GR	Grande
INSTIT	Institución
PER	Persona
INF	Información
AT	Asistencia Técnica
ENT	Entrenamiento
SER	Servicio
N	Nada
L	Local
I	ICAITI
O	Otros
PRO	En proceso
PND A	Pendiente de aceptación
NO A	No aceptada
T	Terminado

Rama Industrial

- | | |
|---------------------------|--|
| 1. Productos alimenticios | 11. Caucho |
| 2. Bebidas | 12. Productos químicos |
| 3. Tabaco | 13. Derivados del petróleo |
| 4. Textiles | 14. Productos minerales no metálicos |
| 5. Calzado y vestuario | 15. Metales básicos |
| 6. Madera | 16. Productos metálicos |
| 7. Muebles | 17. Maquinaria, excepto eléctrica |
| 8. Papel y cartón | 18. Maquinaria, aparatos y accesorios eléctricos |
| 9. Imprentas | 19. Equipo de transporte |
| 10. Cuero y productos | 20. Industrias diversas |
| | 21. Otras |

Instituciones

- | | |
|------------------------------|----------------|
| 1. Gubernamentales centrales | 3. Educacional |
| 2. Gubernamentales locales | 4. Médica |

- | | |
|------------------|------------------------------|
| 5. Comunicación | 12. Internacional |
| 6. Financiera | 13. Embajada |
| 7. Profesional | 14. Cooperativa |
| 8. Investigación | 15. Autónoma |
| 9. Comercio | 16. Semi-autónoma |
| 10. Religiosas | 17. Asistencia internacional |
| 11. Culturales | 18. Fundación |
| | 19. Otros |

NOTA: Deberá especificarse si es (a) Institución privada, o (b) estatal.

Tipo de Información

1. Materia prima
2. Procesos
3. Equipo
4. Otros

Tipo de asistencia técnica

- | | |
|------------------------|------------------------------------|
| 1. Diagnóstico | 9. Relaciones humanas |
| 2. Administración | 10. Normas de calidad |
| 3. Finanzas | 11. Factibilidad |
| 4. Producción | 12. Organización |
| 5. Compras | 13. Procesos |
| 6. Mercado | 14. Contable |
| 7. Diseño | 15. Otros |
| 8. Relaciones públicas | c. Cuando quede a nivel de estudio |

Servicios

- | | |
|--|--|
| 1. Analítico | 3. Certificado de capacidad instalada |
| 2. Certificado de origen de materia prima y/o producción | 4. Dictámen técnico (d) analítico o (e) no analítico |
| | 5. Otros |

Entrenamiento

- | | |
|-------------------------------|-------------------------------------|
| 1. Cursos | 3. Conferencias |
| 2. Entrenamiento "on the job" | 4. Seminarios, mesas redondas, etc. |
| | 5. Otros |

NOTA: Deberá especificarse el lugar donde se llevó a cabo el entrenamiento así: (f) en el ICAITI, (g) en el local del contrato y (h) en otro lugar

Propuestas en proceso por:

1. Representante
2. Divisiones ICAITI
 - (i) Dirección
 - (j) Desarrollo Científico y Tecnológico

- (k) Documentación e Información
 - (l) Servicios Técnico-Industriales
 - (m) Análisis, Pruebas y Ensayos
 - (n) Investigación Aplicada
 - (o) Edición Técnica
 - (p) Normas
 - (q) Geología
3. Oficina central PTT
 4. Otros .

Propuestas pendientes de aceptación

Indicar en orden numérico las veces que se hagan cambios en la propuesta antes de su firma.

NOTA: En "ORGANIZACION/EMPRESA" agregar al nombre un (1) si afecta a dos o más instituciones